Ministry of Military Production

**Under the Patronage
of H.E Prime Minister**

EAE&AT

أكاديمية البحث
العلمي والتكنولوجيا
Academy of Scientific
Research & Technology

46th International Conference of (AEAS)
Association of Egyptian American Scholars
"Sustainable Development in Egypt
Tomorrow's Innovative Advancements"

Cairo, Egypt, Dec. 24-26, 2019

Profiles & Book of Abstracts

الأكاديمية المصرية للهندسة والتكنولوجيا المتقدمة

ينعقد المؤتمر السادس والأربعون لرابطة العلماء المصريين بأمريكا وكندا تحت رعاية السيد الدكتور رئيس مجلس الوزراء وباستضافة وزارة الإنتاج الحربى

Conference Topics

Engineering and Technology

Basic & Medical Science and Public Health

Business and Commerce

Green Technology

Industry 4.0

Smart Cities

Recycling

2

In Partnership with Egyptian Academy for Engineering and Advanced Technology (EAE&AT)

Under the patronage of honorary

Dr. Mohamed Said Al-Assar

**Minister of State for Military Production
EAE&AT Board President**

Dr. Hassan Abdel Magied

Vice President of National Organization for Military Production

Prof. Mahmoud M. Sakr

President of Academy for Scientific Research and Technology (ASRT)

Prof. Wahied G. Ali Abdelaal

Dean of Egyptian Academy for Engineering & Advanced Technology **(EAE&AT)**

3

AEAS Board of Directors

President

Dr. Naser El-Sheimy
University Of Calgary

Past President

Dr. Adel Elmaghraby
University of Louisville

Vice President

Dr. Adel M. Talaat
University of Wisconsin

Vice President

Dr. Mohamed Hegab
California State University

Secretary General

Dr. Ahmed Shaker
Ryerson University

Treasurer

Dr. Mohamed Attalla
University of Illinois

4

Conference Organizing Committee

Conference Co-Chair (Canada)

Prof. Naser El-Sheimy

AEAS President

Conference Co-Chair (USA)

Prof. Mohamed Attalla

AEAS Treasurer and Past President

Conference Co-Chair (Egypt)

Prof. Wahied G. Ali Abdelaal

Dean of Egyptian Academy for Engineering
& Advanced Technology

Chair of Financial Affairs

Dr. Adel Talaat,
AEAS Vice President

EAE&AT Organization Committee

President

Prof. Wahied G. Ali Abdelaal

Management and Coordination

Publications & IT

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Planning and development Coordinator

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Mr. Amer Elbadry

Ms. Nancy Abdel Hameed

Media coordination

Mr. Mohamed Bakr

The Association of Egyptian American Scholars (AEAS)

The idea of creating the Egyptian-American scholars association started by a discussion between Dr. Mohamed El-Wakil of Wisconsin and Dr. Ahmed Shouman of New Mexico in 1968. They both pursued the formalization of the group supported in Cairo by the Egyptian government and the Society of Friends of Egyptian Scholars Abroad. In 1971, fifteen Charter members were declared, and by 1972 the registration list reached 62 members. In 1973, the Association of Egyptian-American Scholars in the United States and Canada was formally established, and by 1974 it was officially incorporated in the State of Wisconsin, with Dr. Mohamed El-Wakil as its President. Through the years close to 600 scholars have joined the Association, very many are still active and supportive.

Since 1974, the Association of Egyptian-American Scholars has contributed abundantly to the scientific and cultural development of Egypt on one hand, and to the academic collaboration of its members in North America. A few examples of these achievements are highlighted below:

- Through the affiliation of several members with research centers in US and Canada, an important link has been established between them and Egypt.

- Since its birth, the AEAS has maintained strong ties with Friends of Egyptian Scholars Abroad (FOESA) in Cairo, which helped reunite them occasionally with the local scholars.

- So far, AEAS has participated in ten of the biannual Cairo conference on "Egypt - The Year 2000," held by FOESA delivering most of the papers there from overseas and has regularly published those conference proceedings.

- Several libraries in Egypt were supplied with books, scientific periodicals and microfilms. Some members donated their own personal libraries.

- Numerous members have participated in United Nation TOKTEN program, which contributed significantly in transforming technological knowledge through Egyptian expatriates of North America.

- Through distinguished members, AEAS has placed Egypt under a program that benefit twelve nations in family planning; has helped Egypt to benefit from several applications of the American satellite research and development; and has placed Egypt among six countries receiving technical information from the American Institute of World Resources.

- Members gave several gifts (i.e. needed equipment/spare parts) to Egyptian Universities and centers; and others donated money to cultural and charitable organizations, pharmaceutical chemicals were donated to the Cairo National Research Center, a bilingual computer/printer were offered to FOESA to assist in preparing Cairo conference.

- AEAS contributed to the reconstruction of ancient library of Alexandria, and

established a special fund to its project of "Dar El-Adeeb El-Misri" where great

Egyptian writers can be displayed. This effort amount to over $10,000 cash donation to the Bibliotheca Alexandrina.

- The Association donated several computers to. Egyptian Ministry of Education to establish three centers where secondary school teachers can be trained to use them.

- An anonymous AEAS member has donated $10,000 to the Egyptian Minister of Scientific Research restricted to cancer treatment research in Egypt.

- AEAS has conducted several conferences in North America dealing mainly with development in Egypt where the Egyptian Ambassadors in US and Canada served as guest speakers.

- AEAS has invited the two top students among Egyptian Secondary School graduates to visit US major cities and historic sites, hosted by Egyptian-American families.

- Several members participated in a study tour visiting main Egyptian cities and meeting with some dignitaries there. Besides, AEAS has donated a few scholarships to Egyptian-American students to take summer courses in Egypt.

- Some grants and research fellowships have been offered to college graduates in Egypt through AEAS members; and a pattern has been initiated to recognize and honor distinguished scholars among our members.

- AEAS has maintained a periodic newsletter including member news, opinions, abstracts, budget updates, and other concerns. The newsletter mailing list has been updated and enhanced to reach over 500 names.

For more information about AEAS, you can visit the site below.

http://www.aeascholars.org/

http://www.aeascholars.org/AEAS-Directory-Full.pdf

8

EAE&AT Board President's Message

Dear Conference participants,

I'd like to personally welcome each of you to The Association of Egyptian American Scholars (AEAS) 46th Annual International Conference *about* *"Sustainable Development of Egypt, Tomorrow's Innovative Advancements"*.

It is my honour to extend a warm welcome to the Association of Egyptian American Scholars (AEAS), for the first time is being hosted by Egyptian Academy for Engineering & Advanced Technology (EAE&AT). I am glad that you, as leading scientists and experts from Canada and USA, have come together here to share the options and possibilities to enhance the Egyptian economics.

Ministry of Military Production strives to achieve the objectives of sustainable development with its distinct human and technological capabilities through the integration of industry and production system of about (17) facilities in military production with the system of education and scientific research in the ministry. The Ministry of Military Production has a distinguished education system to support the industry, including technical and technological education in Helwan and El - Salam, as well as engineering education represented by the Egyptian Academy of Engineering and Advanced Technology (EAE&AT).

9

There is also Science & Technology Center of Excellence (STCE), which works to turn research outcomes into industrial products and supports the process of product development. There is also an Information System & Computer Center (ISCC) to provide IT technical support with its expertise in the field of information technology.

Ministry of Military Production with its all capabilities is already in cooperation with Egyptian scientists to solve research and industrial problems of adding values to achieve the goals of sustainable development and strategic plans of the State 2030. We hope that every one of you will enrich the activities of this conference with scientific discussions and exchange of experiences to come up with recommendations that contribute to solve problems and support the knowledge-based economy.

Finally, we thank the Prime Minister for sponsoring the conference and we hope that this conference will be a successful and fruitful conference that will achieve its objectives and come up with distinct results and recommendations.

Dr. Mohamed Said El-Assar
Minister of State for Military Production

The Academy of Scientific Research and Technology (ASRT)

The Academy of Scientific Research & Technology (ASRT) is established in September 1971 by the Presidential Decree No 2405 as the national authority responsible for science & technology in Egypt. In 1998, ASRT was reorganized by the Presidential Decree No 377 that defined its mission, function and activities. ASRT is the Egyptian house of expertise and the main governmental supporter of complete cycle of innovation, IPR, technology transfer and commercialization. It brings together outstanding Egyptian scientists and experts from universities, research institutions, private sector, NGOs, policymakers and prominent Egyptian scientists in Diaspora to deliberate country problems, propose technological solutions,   out future strategic studies and support the implementation of the proposed action plans to tackle these problems.

ASRT adopts a comprehensive plan for developing Egyptian S&T to support relevant national ministries and research institutions in creating an integrated system of scientific research together for increasing the number of trained scientists in Egypt, and giving science a leading role in the country's development and knowledge based economy. ASRT also promotes science and society, encourages female and youth participation in S&T and scientific leadership.

Our vision is to be an Effective National Academy, cooperates with other entities of STI, to improve scientific and economic status of Egypt

Our mission is to nurturing enabling environment for STI and supporting the complete cycle of innovation

11

We are very keen to collaborate with highly effective stakeholders to strengthen our networks and serve our objective, that's why we have a long lasting collaboration with AEAS network.

Bringing our eminent experts in diaspora together with our local scientist has been one of our main targets and it is the core objective of JESSOR Development Program "one of ASRT programs" to tackle national challenges with our master minds in diaspora.

This has said, for the third year in row we open a special call within this program for AEAS members believing in their abilities in high quality research, transfer knowledge and their genuine interest in advancing and enrich scientific communities in Egypt.

Wish you best of luck and fruitful event

Prof. Mahmoud Sakr

President, Academy of Scientific Research and Technology

The Egyptian Academy for Engineering & Advanced Technology (EAE&AT)

Egyptian Academy for Engineering & Advanced Technology (EAE&AT) is a non-profit Engineering institute affiliated to Ministry of Military Production (MOMP) and under supervision of Ministry of Higher Education and Scientific Research in Egypt.

EAE&AT adopts an educational policy based on the shift from teaching to learning through activities and developing students' skills to graduate an engineer who fulfills the requirements of the 21st century labor market. To graduate an engineer capable of solving problems and creativity and decision-making and accommodating the growing technological development at a rapid pace in the era of the fourth industrial revolution. Therefore, despite the recent start of study in 2015/2016, the Academy has been interested in achieving the following strategic goals:

Paying attention to the quality of the educational process and developing it to produce distinguished engineers capable of meeting the needs of the labor market.

Interest in research outcomes and linking scientific research with industry.

Interactive and positive participation in the community through a set of protocols with Egyptian and International universities and modern technological companies.

EAE&AT's Vision is to be a distinguished institute in engineering sciences and advanced technology in local, regional, and international levels aiming to achieve sustainable development through the improvement of manufacturing and production systems.

13

EAE&AT's Mission is to graduate distinguished engineers capable of satisfying the needs of the labor market to develop the national manufacturing and production systems. Achieve continuous development and quality assurance through an integrated system to compete in local, regional, and international levels.

EAE&AT Learning Objectives:

1. Prepare distinguished graduates with excellent ability in problem solving and engineering design.

2. Acquire behavioral standards and ethics for engineering profession.

3. Learn advanced technologies and carry out research, innovation, and discovery.

4. Contribute in the community service and work to resolve the industrial, economic and developmental problems.

The Engineering disciplines in EAE&AT involve:

1- Electrical Engineering (Electronics & Communications Engineering Program - 170 C.HRs)
2- Mechanical Engineering (Mechatronics Engineering Program -170 C.HRs)
3- Chemical Engineering (Chemical Engineering Program - 170 C.HRs)

There are three research groups in EAE&AT:
- Water treatment research group
- Renewable energy research group
- Manufacturing technology research group

For more information about EAE&AT, you can visit the site below:

https://www.eaeat.edu.eg

Prof. Wahied G. Ali Abdelaal

**Dean of Egyptian Academy for Engineering
& Advanced Technology (EAE&AT)**

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AEAS President's Message

Dear Colleagues,

On behalf of the Association of Egyptian American Scholars, I am honored and delighted to welcome you to the 46th Annual Conference, Association of Egyptian American Scholars (AEAS) on "Sustainable Development of Egypt, Tomorrow's Innovative Advancements"

Our technical program is rich and varied with many speakers from the USA, Canada and Egypt. As for any conference, the success depends ultimately on the many people who have worked hard in planning and organizing both the technical program and supporting social arrangements. I would like to thank my colleagues for the effort in planning and organizing the conference. Our hosts and colleagues from Egypt are certainly what makes us all want to come and participate. Special thanks to Professor Mohamed Attalla and Professor Wahied G. Ali Abdelaal for their effort in making this event happen. I also would like to thank all my colleagues of the authors for their effort in having a scientifically sound meeting.

This year, we have special thanks to our host H.E Dr. Mohamed Said El-Assar, Minister of Military Production Minister, for the tremendous support in hosting the conference.

Certainly, I hope that we can all take this opportunity to maintain and increase our interaction and continue to build bridges of collaboration among us in many different ways. Our beloved Egypt will have a better future when we all work together towards higher aspirations and goals.
 Many Thanks to All,

Professor Naser El-Sheimy, PEng

The University of Calgary
President, Association of Egyptian American Scholars
Established in Canada and USA in 1974

AEAS Conference Organization Co Chair

Dear Colleagues,

I wish to welcome you all, your contributions and your collaborative efforts to the 46th Annual Conference of the Association of Egyptian American Scholars (AEAS). AEAS was established 46 years ago in Canada and the United States of America. The AEAS mission is to create a forum for North American Egyptian Scholars that facilitates dialogue and promotes partnerships with Egyptian counterparts to implement beneficial scholarly endeavors.

Over the past 46 years AEAS members and affiliates have lead many partnerships and research endeavours that aimed at Egypt's Social, Scientific, and Economic developments. Contributions included Higher Education Enhancement Programs, Code developments, manufacturing as well as Engineering and Medical research.

Organizing our annual conferences in Egypt has never been an easy task. This year AEAS is fortunate to have the major sponsor and partner as the ministry of Military Production under the leadership of H.E. Dr. Major General Mohamed Said El-Asaar. Also our host the Egyptian Academy for Engineering and Advanced Technology under the leadership of Dr. Wahied Gharieb Ali Abdelaal as our host has made this year's conference a great success. Their support to the conference and organize its activities are highly appreciated.

This year we have the pleasure of the presence of 26 colleagues from USA and Canada are participating in this conference and are joined by 28 conference papers that are presented by colleagues in research institutions inside Egypt. This is including topics such as the Fourth Industrial Revolution, Water Resources in Egypt, Smart Cities, Digital Transformation Skills in Education, etc.

I wish you all a wonderful and enjoyable scientific event.
Thank you,
Dr. Mohamed Attalla, P.Eng., MBA
Executive Director, University of Illinois
Treasurer and Past President, Association of Egyptian American Scholars
Established in Canada and USA in 1974

AEAS Bylaws

I. Name

The name of the association is "Association of Egyptian-American Scholars, Inc."

II. Principal Office

The principal place of business of this association is Madison, Wisconsin.

III. Nature of the Association

The Association of Egyptian-American Scholars is a non-sectarian, private, non-profit, educational, cultural, non-political, association of scholars of Egyptian origin who are either citizens or permanent residents of the United States and Canada.

IV. Purposes

To promote and improve Egyptian-American cultural and scientific relations through the development and implementation of specific programs of interest and value to the cultural and scientific development of Egypt.

V. Membership

1. **Classification:**
   REGULAR membership is open to those of Egyptian origin who are citizens or permanent residents of the United States and Canada, and whose background and experiences fall within the cultural and scientific purposes of the Association and whose interests coincide with those purposes.

   ASSOCIATE membership is open to those of Egyptian origin who are on a temporary stay in the U.S. or Canada, but otherwise meet regular membership requirements.

   SPECIAL membership is open to those not of Egyptian origin who have qualifications and interests to contribute to the purpose of the Association.

2. **Procedure:**
   To become a member, the applicant must be recommended by the local chapter, if one exists. If a local chapter does not exist, then the applications must be recommended by two regular members of the Association, and be approved by a simple majority of the Board of Directors of the Association.

3. **Dues**
   Each member shall pay annual membership dues in such an amount as fixed by the Board of Directors annually.

4. **Voting Rights**
   Voting rights are afforded only to regular members.

VI. Programs and Activities

1. The Board shall develop programs and activities within the scope of the Association's purposes, and in particular the Visiting Scholar Program and the Science Education Fund.

2. The Visiting Scholar Program is a cultural-scientific program in which scholars of Egyptian origin who reside in the United States and Canada and who have achieved recognized academic or professional status through demonstrated expertise in their field, and whose knowledge and experience may be needed in Egypt, would be invited by Egypt to provide such services as they might be able to perform.

   The Association will, in conjunction with a counterpart organization in Egypt, assist in matching registered scholars to needed expertise. The final decisions as to the number and type of scholars to be invited at any one time is up to the Egyptian authorities. The registered must also be members of the Association.

3. The Science Education Fund is established to help supply scientific equipment and material to Egyptian educational research institutions. The Fund is collected as part of the annual membership dues as well as from additional voluntary contributions.

VII. Meetings of the Membership

1. There shall be annual meeting of the membership and such other meetings as the Board or membership may schedule.

2. Meetings may be held in Egypt or anywhere in the U.S.A. or Canada, as Membership may decide.

3. Meetings shall be called by an affirmative vote of the Board of Directors at the request of 25% of the regular members.

4. Notice of such meetings shall be in writing at least 30 days prior to any such scheduled meeting.

5. The quorum shall be 20% of the membership of which 10% must be physically present.

6. Voting by proxy is permitted provided that the proxy is in writing and verified by the Secretary.

VIII. Financial Resources

The Association shall derive its financial resources from dues and contributions of members and other sources which are acceptable to the Board within the scope and purposes of the Association.

18

IX. The Board of Directors

1. The Board of Directors shall consist of five elected regular members, and all presidents of Local Chapters ex officio. Only five elected regular members shall be voting. The outgoing president of the Association shall also be ex officio member.

2. *Officers*
The officers shall be a president, two vice presidents, a secretary and a treasurer, who shall be elected from among the Directors by the membership.

The President shall chair all meetings of the Association or, in his absence, one of the Vice Presidents, and shall be responsible for the management of the Association within the scope of its purposes subject to the policies established by the Board.

3. *Treasurer*
The Treasurer shall be in charge of handling all funds for the Association and shall deposit in a bank, approved by the Board, all the funds received, make all disbursements in accordance with the approved budget; have the right to sign checks. The Treasurer shall be responsible for keeping the financial records of the Association, and shall report annually to the membership.

4. *Nomination of Directors and Officers*
A. All nominations shall be made by the regular members and sent to the Secretary who shall compile a list of nominees and a brief biographical sketch, and send a written ballot to all regular members thirty days prior to each annual meeting.
B. Members can vote by written ballot to be sent to the Secretary who shall have the members proxy to vote in accordance with the said ballot.
C. All written ballots shall be verified by the Board.

5. *Term of Office*

Term of Office of all Directors and Officers shall be two calendar years from the date of election. No director or officer can serve more than two consecutive terms.

6. *Local Chapters*

A. At least ten regular members can establish a local chapter subject to the approval of the Board.

B. Each local Chapter shall elect its own officers.

C. Local Chapters shall act within the scope and purposes of the Association and shall be guided by the policies of the Board.

D. Local Chapters may establish membership dues.

E. Membership in local Chapters is open only to members of the Association.

F. Members of the Association are invited to become members of local Chapters where available but are not required to do so.

G. Local Chapters may not solicit nor accept financial contributions other than membership dues except with the approval of the Board.

H. Local Chapters must submit an annual accounting to the Board.

X. Amendments

Amendments to the Bylaws must be by a majority vote of all the regular.

AEAS History

The idea of creating the Egyptian-American scholars association started by a discussion between Dr. Mohamed El-Wakil of Wisconsin and Dr. Ahmed Shouman of New Mexico in 1968. They both pursued the formalization of the group supported in Cairo by the Egyptian government and the Society of Friends of Egyptian Scholars Abroad. In 1971, fifteen Charter members were declared, and by 1972 the registration list reached 62 members. In 1973, the Association of Egyptian-American Scholars in the United States and Canada was formally established, and by 1974 it was officially incorporated in the State of Wisconsin, with Dr Mohamed El-Wakil as its President. Through the years close to 600 scholars have joined the Association, very many are still active and supportive.

auspices of President Mohamed Anwar Sadat, December 1974

Since 1974, the Association of Egyptian-American Scholars has contributed abundantly to the scientific and cultural development of Egypt on one hand, and to the academic collaboration of its members in North America. A few examples of these achievements are highlighted below:

- o Through the affiliation of several members with research centers in US and Canada, an important link has been established between them and Egypt.
- o Since its birth, the AEAS has maintained strong ties with Friends of Egyptian Scholars Abroad (FOESA) in Cairo, which helped reunite them occasionally with the local scholars.
- o So far, AEAS has participated in ten of the biannual Cairo conference on "Egypt - The Year 2000," held by FOESA delivering most of the papers there from overseas and has regularly published those conference proceedings.
- o Several libraries in Egypt were supplied with books, scientific periodicals and microfilms. Some members donated their own personal libraries.

21

- o Numerous members have participated in United Nation TOKTEN program, which contributed significantly in transforming technological knowledge through Egyptian expatriates of North America.
- o Through distinguished members, AEAS has placed Egypt under a program that will benefit twelve nations in family planning; has helped Egypt to benefit from several applications of the American satellite research and development; and has placed Egypt among six countries receiving technical information from the American Institute of World Resources.
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- o AEAS has maintained a periodic newsletter including member news, opinions, abstracts, budget updates, and other concerns.

AEAS Presidents

Dr. Mohamed El-Wakil	**1975-1978**
Dr. M. Cherif Bassiouni	1979-1980
Dr. Mohamed El-Wakil	1981-1984
Dr. Ibrahim Oweiss	1985-1988
Dr. Mohamed Selim	1989-1990
Dr. Badr El-Din-Ali	1991-1994
Dr. WagihaTaylor	1995-1998
Dr. Badr El-Din-Ali	1999-2002
Dr. Ayman El Mohandes	2003-2006
Dr. Amer El Ahraf	2007-2008
Dr. Mohamed Attalla	2009-2012
Dr. Tawfik Ayoub	2013-2014
Dr. Adel Elmaghraby	2015-2018
Dr. Naser El-Sheimy	2019-Present

AEAS 46th, Annual International Conference – 2019

Conference Program (46th AEAS)

Tuesday, December 24th, 2019. El-Salam Theater

Time	Event
16:00 - 17:00	**VIP Welcome**
17:00 - 18:00	**National Anthem**

National Anthem

Opening Talks:
- Prof. Mohamed Attalla (AEAS Conference Co-Chair)
- Prof. Naser El-Sheimy (AEAS President)
- Prof. Wahied G. Ali Abdelaal (EAE&AT Dean)
- Prof. Mahmoud Sakr (ASRT President)
- Dr. Khaled Abdel Ghafar (Minister of Higher Education & Scientific Research)
- Dr. Nabila Makram (Minister of State for Immigration and Egyptian Affairs Abroad)
- Dr. Mohamed Said El-Assar (Minister of Military Production)

Keynote Speakers

Title	Speaker
"The Role of sensors in Smart Cities"	**Dr. Naser El-Sheimy** Professor, Dept. of Geomatics Engineering, The University of Calgary, **Canada**
"Personalized Learning, AI and Education Technology: Digital Transformation Skills Challenges Today and in the Future"	**Dr. Mohamed Elhabiby** President of RoboGarden and Executive Vice President of Micro Engineering Group, Alberta, **Canada**
"Smart Manufacturing - The 4th Industrial Revolution"	**Dr. Waguih El Maraghy** Professor, Dept. of Mechanical, Automotive & Materials Engineering, University of Windsor, **Canada**

(Time for Keynote Speakers: **18:00 – 19:30**)

Honoring (Sponsors)

24

Conference Program (46th AEAS)

Wednesday, December 25th, 2019. Triumph Hotel

Date Time	Title	Speaker
8:00 – 9:00	Registration	
9:00 – 10:15	**Session (A) : Engineering & Technology (1)** **Session Chair: Prof. Ahmed Mohamed (USA) &** **Prof. Hany Monieb (Egypt)**	
	"Improving the Energy Efficiency of the Transportation Sector: Practical Experiences from the New York City Case"	**Ahmed Mohamed**, Assistant Professor, Grove School of Engineering, , City College of the City University of New York, **USA**
	"Attenuation Effectiveness of Double Phase Stainless Steel Alloys for Fusion Reactor System"	**Noha Mohamed Ali** and others, Lecturer assistant at Egyptian Russian University, **Egypt**.
	"Behavior of RC Beams with Openings Strengthened with CFRP Laminates"	**Ghada Gamal**, Assistant professor at the construction Department Egyptian Russian University (ERU), **Egypt**.
	"Estimating Ultimate Recoveries of Unconventional Reservoirs: Knowledge Gained from the Developments Worldwide and Egyptian Challenges"	**Omar Mahmoud**, Assistant Professor at the Future University in Egypt (FUE), Former Reservoir Engineer at Apache Corporation, **USA**
	"Nanoparticle-Based Drilling Fluids as Promising Solutions to Enhance Drilling Performance in Egyptian Oil and Gas Fields"	**Ahmed Samy Mady** and others**,** Teaching Assistant at the Future University in Egypt (FUE), **Egypt**.
10:15 – 11:45	**Session (B) : Industry 4.0** **Session Chair: Prof. Hoda El Maraghy (Canada) &** **Prof. Gamal Mohamed Aly (Egypt)**	
	"Sustainable Manufacturing: Opportunities and Challenges"	**Dr. Hossam Kishawy,** Associate Dean, Faculty of Engineering, Ontario Tech University, **Canada**
	"Computational Research, AI and the Digitized Economy: A look into the future"	**Dr. Abdel-fattah S. Yousif,** Director, Advanced Research Computing University of Calgary, **Canada**
	"Blockchain-Architecture for Secured Data Storage"	**Dr. Tarek Saadawi,** Director, Center for Information Networking & Telecommunications, City University of New York, City College, **USA**
	"Survey of Apache Spark Optimized Job Scheduling in Big Data"	**Walaa Ali** and others, Computer Science Dept. El-Gazeera High Institute for Eng. and Technology Cairo, **Egypt**
	"Image authentication Technique based on advanced encryption standard (AES), Secure Hash Algorithm and steganography"	**Hosam Eldin Fawzan Elsyied**, Asis.Lecture in Faculty of Engineering Collage at Sinai university, **Egypt**
	"Remote sensing technologies for sustainable developments"	**Ahmed Shaker Abdel Rahman** and others, Associate Professor, Civil Engineering, Faculty of Engineering and Architecture Science, Ryerson University, **Canada**
11:45 – 12:30	Coffee Break	

25

Date Time	Title	Speaker
	Panel Discussion(1) "Water Resources in Egypt"	
12:30 – 13:45	(Microbial Desalination Cells (MDCs): "Performance Assessment and Potential Practical Applications for Wastewater Treat"	**Dr. Mohamed Gamal El-Din,** University of Alberta **, Canada**
	"Earth observations and data science addressing water issues in Egypt "	**Dr. Hesham M. El-Askary,** Chapman University , **USA**
	"Utilization of deposited sediment in Aswan High Dam Reservoir"	**Dr. Tarek Abdel Aziz,** Director of Survey Research Institute, National Water Research Center, Ministry of Water Resources and Irrigation**, Egypt**
13:45 -15:15	**Session (C): Green Technology** **Session Chair: Prof. Amer El-Ahraf (USA) &** **Prof. Mohamed El Sobky (Egypt)**	
	"Design and Development of a Small Scale Vertical Axis Wind Turbine"	**Ahmed Elsawy** and others , Professor - Manufacturing & Engineering Technology- Tennesse University Tech , **USA**.
	"Research and Innovation in Green Technology"	**Maisa Salah El-Din and others**, General Manger of Quality Control & Environment Alexandria Water Company, **Egypt**.
	"The Role of Environmental Health in Attaining a Sustainable Development in Egypt"	**Amer El-Ahraf**, Professor of Health Sciences and Vice President Emeritus, California State University, Dominguez Hills, **USA**
	"Detection of Islanding Phenomenon for Renewable energy systems"	**Yassser Elshrief** , Teaching Assistant, Electrical Engineering, Egyptian Academy for Engineering and Advanced Technology, **Egypt**.
	"Exploring Inclusiveness In Green Hotels For Sustainable Development In Egypt."	**Mai Eid Khalil** , Assistant Professor Architectural Engineering Department Aswan University, Aswan, **Egypt**
	"Magnetized water: New green technology tool for improving Egyptian agriculture sector"	**Mahmoud Hozayn**, Field Crops Research Deprtment, Agricultural & Biological Research Division, National Research, **Egypt**.
15:15- 16:45	**LUNCH**	
16:45 – 18:00	**Session (D): Smart Cities** **Session Chair: Prof. Adel Elmaghraby (USA) &** **Prof. Essam Khalefa (Egypt)**	
	"Crowd-Sensing based Road Information System"	**Dr. Aboelmagd Noureldin**, School of Computing, Queen's University, **Canada**
	"Recent Advances in Accelerated Bridge Construction (ABC)"	**Dr. Khaled Sennah,** Chair & Professor Civil Engineering, Ryerson University, **Canada**
	"Practical Challenges in Delivering Infrastructure Rehabilitation Projects"	**Tarek Hegazy**, University of Waterloo, Canada, **Mohamed Attalla**, University of Illinois, USA &**Ehab Kamarah**, York University, **Canada**

26

Date Time	Title	Speaker
	" Smart practices of biodiversity, present and future of ecosystem-Educational Approach"	**Fatma Salem** , Associate Professor, Faculty of Education, Ain Shams University, **Egypt**
	"Artificial Intelligence Tracking of Healthcare using Social Networks"	**Adel Elmaghraby**, Professor and Chair of the department of Computer Sciences, University of Kentucky, **USA**

Thursday, December 26th , 2019

Date Time	Title	Speaker
9:00 – 10:30 Big Hall	**Session (E) : Engineering & Technology(2)** **Session Chair: Prof. Khaled El Rayes (USA) &** **Prof. Nagwaa Badr (Egypt)**	
	"Optimizing Emissions from Business Employees Sharing Multiple Work Locations"	**Moatassem Abdallah and others**, Assistant Professor, Department of Civil Engineering, University of Colorado Denver, **USA**
	"Optimization Model for Repetitive Construction Projects with Multiple Crews and Multiple Options of Construction Methods"	**Moatassem Abdallah and others**, Assistant Professor, Civil Engineering, University of Illinois, **USA**
	"Effect of Processing and Alloy Composition on Microstructure and Wear Resistance of α/β Titanium Alloys for Aviation Applications"	**Shimaa El-Hadad and others**, Associate Professor Department of Casting Technology Central Metallurgical R&D Institute, Cairo, **Egypt**
	"30 years success story of casting technology at CMRDI"	**Khaled M. Ibrahim**, Central Metallurgical R&D Institute-CMRDI Head of Casting Technology Dept. Vice Head of Manufacturing Technology Dept., Cairo, **Egypt**
10:30 -12:00 Big Hall	**Session (F) : Recycling** **Session Chair: Prof. Mohamed Gamal El-Din (Canada) &** **Prof. Mohamed Amin El-Shahir (Egypt)**	
	"Renewable Energy Production from Municipal Solid Wastes: Current Status and Techniques for Improvement"	**Elsayed Elbeshbishy**, Assistant Professor, Civil Engineering, Faculty of Engineering and Architectural Science, Ryerson University, **Canada**
	"Green Star-shaped Polymeric Membrane for Water Treatment	**E. G. ZAKI and S.M.Elsaaed**, Doctor in applied chemistry Egyptian Petroleum Research Institute (EPRI) Cairo, **Egypt.**
	"Converting the conventional activated sludge treatment system to tertiary treatment using an innovative hybrid system "Full-scale case study"	**Ahmed M. Noureldin and others**, Housing and Building National Research Center(HBRC), Cairo, **Egypt**
	"Reduction of Pollution Load into the Receiving Environment in Enhanced Primary Treatment of Municipal Wastewater under Wet Weather Flow Conditions"	**Mohamed Gamal El-Din and others**, Professor; Civil & Environmental Eng. Depart. University of Alberta, **Canada**

27

Date Time	Title	Speaker
9:00 – 10:40 Small Hall (Parallel session)	**Session (G) : Basic & Medical Sciences** **Session Chair: Prof. Abdel Rahman (USA) &** **Prof. Laila M.M. Bidak (Egypt)**	
	"Classification of Medical Ultrasound Transducer Using Neural Network"	**Kamal kamel Kamal Mohamed Tawfic** & **Prof. Laila Mohamed Abdelhalim Aboughazala**. Center of Studies, Alazhar University, Medical School, **Egypt**
	"Portfolio Assessment in Medical Education"	**Mostafa Abdel Nasser** ,Faculty of Medicine, Al-Azhar University, **Egypt**
	"Study Gut Microbiota in HCV Patients Responders and Non Responders"	**Reda Elbadawy**, professor Gastroenterology, Hepatology and Infectious disease Banha University , **Egypt**
	"Conservation of Posidonia oceanica (L.) Delile in the coastal habitat, western Mediterranean region, Egypt"	**Laila M.M. Bidak** and others, Professor of Plant ecology, Botany & Microbiology Department, Faculty of Science, Alex. University, **Egypt**
	"Is Reticulocyte Hemoglobin Content a Sensitive Index of Iron Status"	**Eman Elbostany and others**, Pediatrict Department, National Research Centre, Giza, **Egypt**
	"study the prevalence of Non Alcoholic Fatty Liver Disease among Banha University employees"	**Reda El Badawy**, professor Gastroenterology, Hepatology and Infectious disease Banha University, **Egypt**
10:40 -12:00 Small Hall (parallel session)	**Session (H) : Business and Commerce** **Session Chair: Prof. Wagiha Taylor (USA) &** **Prof. Eman EL-Azyzy (Egypt)**	
	"Creating Nearby Markets"	**Ghada Farouk Naiem Elsayed**. Assistant professor, AUC university, Electronics department, **Egypt**
	"Egypt's Nationally Determined Contributions to Paris Agreement: Review and Recommendations"	**Lamiaa Abdallah**, Alexandria higher Institute of Engineering & Technology (AIET), **Egypt**
	" China's Balance of Payments Evolution from Deficit to Sustainability Surplus"	**Prof. Doaa Wafik,** Higher Institute of Administrative Sciences **Egypt** and **Prof. Assem Tharwat,** American University in the Emirates, **UAE**
	"Exact Minimum Lower Bound Algorithm for Traveling Salesman Problem"	**Mohamed Eleiche**, Lecturer Geomatics, Phd, Eng. Egyptian Russian University, **Egypt**
	Research on Inclusive Education in Egypt; Can it be a factor in enhancing Sustainable Development?	**Hadeel EL-Ahraf,** Adjunct Professor, Department of Psychology, American University in Cairo, **Egypt**
12:00-12:45	**Coffee Break**	

Date Time	Title	Speaker
	Panel Discussion (2): Smart Cities	
12:45-14:15 **Big Hall**	"A Cost-Effective Viable Strategy for Gradually Transitioning Egypt's Cities into Truly IoT-enabled Smart Cities"	**Dr. Mohamed Ali and Dr. Ahmed Mahmoud,** City university of New York**, USA - Dr. Tarek Youssef**, University of West Florida, **USA**
	"Smart Cities in the 21st Century"	**Dr. Mohamed Attalla,** Executive Director, University of Illinois, **USA**
	"Smart Cities Sustainable Development"	**Dr. Mohamed El-Bostany**, the head of the Real Estate Developers in New Cairo, **Egypt**
14:15 -15:45	LUNCH	
15:45 –17:30 **Big Hall**	**JESOR Session:** • **Dr. Amro Radwan** (ASRT – JESOR Director), Cairo, **Egypt** • **Mrs. Salma Essawi (**ASRT – JESOR Coordinator)**, Cairo, Egypt** **Conference Recommendations:** • **Prof. Naser El-Sheimy** (AEAS President), **Canada** • **Prof. Mohamed Attalla** (AEAS Conference Co-Chair), **USA** • **Prof. Wahied G. Ali Abdelaal** (EAE&AT Dean), **Egypt**	

29

AEAS 2019 ABSTRACTS

The Role of Sensors in Smart Cities

Dr. Naser El-Sheimy
Pro. Eng, CRC,The University of Calgary, Canada

Abstract

Smart cities are no longer the wave of the future. They are here now and growing quickly as sensors technologies and the Internet of Things (IoT) expands and impacts municipal services around the globe. Sensors are the building blocks of smart cities because they gather data about its vital statistics and, in turn, ensure that a city function smoothly. As cities move towards becoming smarter, demand for sensors has increased. Furthermore, advanced sensing systems to improve and automate processes within a city will play a leading role in smart cities. From smart design of buildings, which can sense building movements, to intelligent control systems, which can monitor infrastructures autonomously, the possible improvements enabled by sensing technologies are immense. Ubiquitous sensing poses numerous challenges, which are of a technological or social nature. This presentation presents an overview of the state of the art with regards to sensing in smart cities. Topics include sensing applications in smart cities, sensing platforms and technical challenges associated with these technologies. To provide a holistic view of how sensing technologies play a role in smart cities, a range of applications and technical challenges associated with these applications are presented. The material presented in this presentation attempts to provide a broad overview, which can help researchers and developers in understanding, by example, how advanced sensing can play a role in smart cities.

Personalized Learning, AI and Education Technology: Digital Transformation Skills Challenges Today and in the Future

Dr. Mohamed Elhabiby

President of RoboGarden and Executive Vice President of Micro Engineering Group, Alberta, Canada

Abstract

Currently, most of the education systems and tools are outdated. Psychologists have found evidence that students need to experience learning that is distributed over customized and spaced time. Another interesting finding is interleaving- the practice of switching between topics such as science, technology, engineering, art and mathematics (STEAM). Despite the success of different digital classroom systems in schools in the USA such as google classroom, there are outdated teaching methods and teachers lack the skills required to adapt to the enormous digital changes and increased student load. A need has been identified for an automated Artificial intelligence (AI) Online Education Platform to help with the following:

- Digitization of interactive STEAM content
- Flexibility and speed of continuous content change from the perspective of the subject matter experts as opposed to the developer perspective
- An Artificial Intelligence BOT to assist teachers, parents and students with an adaptive individualized educational development experience

RoboGarden AI Educational Platform is one of the solutions, which will provide an efficient skill development platform to assist teachers, parents, institutions and students prepare for the current and rapidly increasing digital industry. The predominant issues in education globally include:

- Children's programming education lacks qualified programming teachers
- There is no unified standard system for children's programming education
- Most adults programing courses are independently developed and designed based and do not contain clear/useful learning outcomes
- Learning different coding platforms at different ages disrupts the learning process and dilutes the outcome

RoboGarden's Intelligent STEAM educational coding-based platform has been developed to achieve individualized STEAM learning and development skills. RoboGarden's intelligent platform is composed of an online game-based coding platform for teaching children/adults in the classroom, for learning outside of the classroom, and for teachers/instructors to facilitate learning both in the classroom and to parents to coding outside the classroom. Deeply integrated teacher and classroom management/facilitation. RoboGarden bot that is an AI based software module to assist children/adults, teachers/instructors, and schools/universities to make the teaching process more efficient and more productive. The platform main objective is to provide the delivery system of the educational model with the suitable missions based on personalized student learning.

Smart Manufacturing – the 4th Industrial Revolution

Prof. Waguih ElMaraghy & Prof. Hoda ElMaraghy
Prof..Dept. of Mechanical, Automotive & Materials Engineering, University of Windsor.
Canada

Abstract

In North America it is called "Smart Manufacturing (SM)", the Germans call it "Industrie 4.0 (I4.0)", in France it is "Industry of the Future (IoF)", in Japan and China it is "the Fourth Industrial Revolution (4IR)", in Italy it is "La Fabbrica del Futuro (FdF)", and in Egypt it is "الثورة الصناعية الرابعة". Whatever term is used, the idea is the same - industry is at the dawn of a major revolution, the fourth in its history, based on technology and innovation. There are many technological enablers that characterizes Smart Manufacturing / I4.0, the most central of these, besides digitalization, are connectivity and intelligent decision making. Innovation, coupled with industrial productivity, is what drives improvements in living standards. Important enablers and challenges of I4.0, readiness indicators of Egypt's industrial sector and their assessment as well as strategic objectives and road map will be discussed. The requirements for establishing the factories of the future, but also for transforming existing ones to become "factories with a future" will be reviewed. The benefits of adopting I4.0 strategies including improved productivity, quality, competitiveness and profits will be outlined. This presentation, and panel discussion, will address the interest and substantial benefits for Egyptian industries to develop their own products design and introduce smart manufacturing. Owning the product design, coupled with innovation and advanced manufacturing are fundamental for wealth and jobs creation. Smart products and smart manufacturing systems, as well as applicable paradigms and methodologies will be presented. Manufacturing systems have adapted to changes in production volumes, products variety and increasing consumers' demands for more customization and personalization. The increased use of insights, arising from data collection and analysis, will allow more rapid, responsive, adaptive and connected manufacturing; where products and production processes can co-evolve and adapt to changes in the market, on the shop floor, and throughout the enterprise and the supply chain.

Enablers of smart manufacturing systems will be discussed, along with the objectives, features, characteristics and pre-requisites of the fourth industrial revolution. Some observations and recommendations for Egypt's industrial modernization strategy will be made as well as the case for Egypt to join the 4th industrial revolution soon to reap its benefits.

Recent studies have found that investing in science and applied research leads to 10 to 30 times more economic growth than investment in physical capital. Modern technology enables creating new products, but of course it is people who innovate and create. Therefore, preparing the human capital for the inevitable disruption, and importance of technical training of new work force and re-skilling existing workers as well as equipping engineering students and technologists for the future jobs will be highlighted.

Improving the Energy Efficiency of the Transportation Sector: Practical Experiences from the New York City Case

Ahmed Mohamed

Assistant Professor, Department of Electrical Engineering, Grove School of Engineering, City University of New York, City College, NY, USA

Abstract

Transit systems, e.g. the subway and public buses, are substantial consumers of electricity at any city. New York City (NYC) has set up an aggressive plan to reduce its greenhouse gas emissions, namely the NYC Energy Plan. This plan mandates exploring opportunities for energy saving at all sectors, including the transportation sector. This talk summarizes the key findings and lessons learned of multiple projects that the presenter led, in collaboration with the utility company and the public transportation authority in NYC. These projects aimed at improving the energy efficiency of the subway system through effective recuperation of regenerative braking energy, and at increasing the number of electric vehicles and electric vehicle supply equipment in the city. The talk will delve into the applicability of these efforts for Egypt.

Attenuation Effectiveness of Double Phase Stainless Steel Alloys for Fusion Reactor System

N. M. Ali[a], Aly Saeed[a], R. M. El Shazly[b], S. A. Al-Fiki[c], M. M. Eissa[d], S. U. El-kameesy[c]
[a]Nuclear Power Stations Department, Faculty of Engineering, Egyptian-Russian University, Cairo, Egypt
[b]Physics Department, Faculty of Science, Al-Azhar University, Cairo, Egypt
[c]Physics Department, Faculty of Science, Ain Shams University, Cairo, Egypt
[d]Steel Technology Department, Central Metallurgical Research and Development Institute (CMRDI), Helwan, Egypt

Abstract

Measurements and calculations of neutron cross sections and gamma ray attenuation coefficients of modified aluminum, aluminum – tungsten, and aluminum – titanium – tungsten stainless steel alloys were carried out for fusion reactors. The studied alloys were prepared using pilot plant induction furnace at Central Metallurgical Research Institute, Egypt. Neutrons > 10 keV, slow, and total slow neutrons which emitted from ^{241}Am-Be neutron source as well as A wide range up to 1400keV energies of gamma rays, which emitted from Co-60, Cs-137 and Eu-152, were used in the present study. Results showed that aluminum stainless steel alloy has the highest value of total microscopic cross section T. Moreover, there is no significant variation of the value of mass attenuation coefficients (m) for the studied alloys. Good agreement between both experimental and calculated results of mass attenuation coefficients was achieved. The obtained results proved that the studied alloys could be considered as candidate materials for fusion reactor system.

Behavior of RC Beams with Openings Strengthened with CFRP Laminates

Ghada Gamal Ahmed

Egyptian Russian University ERU, Construction Engineering Department, Badr City, Cairo, Egypt

Abstract

Creating a new opening in the shear zone of casted reinforced concrete beams is one of the critical issues during construction due to building safety and cost impact. Moreover, coordination process is a difficult stage that always lead to major impact on project schedule. To investigate the problem of rectangular openings in beams, all beams are studied as simple beams subjected to two-points loading. Third large scale beam specimens with different opening location will be presented in this research. The author presents an analytical study on the behavior of RC beams with openings strengthened with CFRP laminates, in order to predict their behavior before and after strengthening. The opening location, cross section shape (rectangular – T section), number of CFRP layers and compressive strength of concrete are the main parameters that are considered in this research. The current study is carried out using Finite Element Method on software package (ANSYS 15.0). Verification models are simulated at first and compared with similar beams tested experimentally in previous research in order to validate their results, then the parameters mentioned above are analytically studied. The maximum capacity for each beam is obtained after loading them up to failure, then the corresponding displacements are recorded. Moreover, Modes of failure, crack patterns and the relationship between loads and displacements are obtained. Furthermore, the author studies the suitable way to reach the cheapest technical solution in case the opening will be required during design stage or it will be created after casting stage.

Estimating Ultimate Recoveries of Unconventional Reservoirs: Knowledge Gained from the Developments Worldwide and Egyptian Challenges

Omar Mahmoud

Department of Petroleum Engineering, Future University in Egypt

Abstract

Exploring and developing unconventional hydrocarbon resources are gaining more interest, especially with the enormous success in the North America's production from those types of oil and gas reservoirs. Most of the Egypt's Western Desert plays are characterized as supertight reservoirs; however, they were not considered economical because of the high stimulation costs. Recently, the government are targeting the tight layers/zones because of the increase in Egypt's domestic demand for energy and the decline in the annual production from the conventional – high permeability – reservoirs. Several zones within Khatatba source rock in the Shoushan basin as well as in the Abu Gharadig, basin were studied and evaluated to maximize productivity and identify the optimal technology for the future developments. Estimating the ultimate recovery (EUR) and forecasting future production performance are key steps for the economical production from these resources. Forecasting future production and estimating EURs in supertight reservoirs and shale plays has long been problematic and should be constantly updated during the life of a reservoir. Its accuracy depends on the amount of data available and the used method.

In the following work, various methods of history matching the production of unconventional reservoirs were investigated by forecasting future production and predicting EUR's to quantify the differences between them. The traditional Arps' decline for low permeability reservoirs over- forecasts reserves. power-law exponential decline (PLED), stretched-exponential decline (SEPD), logistic-growth model (LGM), and Duong's method were intended to represent the character of rate/time production data for the standard well completion in a multiple-fractured horizontal well in a shale play. These methods provide different forecasts as they have different equation forms. Unfortunately, all of them are not satisfactorily sufficient to forecast production for all unconventional reservoirs. The rate transient analytical (RTA) models requires certain modifications of the reservoir and fracture parameters to provide optimistic EURs when compared to the numerical simulation.

Based on the production forecast and EUR prediction, different models for forecasting unconventional well data have been reviewed and compared in this research. Production data has been used to reveal the accuracy of the models, the similarity of reserves estimation, and the relationship to the reservoir theory. This work might help the Egyptian operating companies to better understand the production dynamics of unconventional reservoirs and suggest a more reliable model of EURs estimation.

Nanoparticle-Based Drilling Fluids as Promising Solutions to Enhance Drilling Performance in Egyptian Oil and Gas Fields

Ahmed Mady [a] , Omar Mahmoud[b] , and Abdel Sattar Dahab[c]

[a,b] Department of Petroleum Engineering, Future University in Egypt

[c]Department of Petroleum Engineering, Cairo University

Abstract

Over the years, the discovery of petroleum in various regions of the world has led to the development of different techniques and equipment to enhance and optimize the drilling and production operations in this vital industry. Egypt is both one of the major oilproducing non-OPEC countries and one of the oldest energy producers in the Middle East. Recently, the Egyptian government have signed several agreements for the exploration of oil and gas in several provinces/regions including; the Mediterranean, the Western desert, the Nile Delta, and the Gulf of Suez. Petroleum companies have given great attention to Egypt's new discoveries such as Zohr Gas Field, and Nour exploration prospect. Successful drilling operations to reach the oil and gas targets depends strongly on the effectiveness of the drilling fluids. Drilling fluids can be considered as the heart of the drilling process. They are used to fulfil several functions, such as controlling pressure, carrying cuttings and cooling bit and drill strings, stabilizing wellbore as well as controlling fluid losses. Drilling fluid technology is one of the most targeted and developed technologies worldwide. Several studies have examined the use of various types of nanoparticles (NPs) as additives to enhance the properties and improve the performance of the drilling fluid to mitigate the drilling problems. NPs can be defined as a simplest structure with a size in the range of nanometers. The effectiveness of NPs can be accredited to their small sizes and thus, high surface-area-to-volume ratio. NPs were also showed promising enhancements on the rheological and filtration characteristics of the drilling fluid (mud). Additionally, swelling and collapse of shale formations is expected under drilling with water-based mud, which might result in complicating the drilling operation. Adding NPs to the drilling mud was found to minimize the shale permeability and thus, promote the wellbore stability. This research paper discusses the latest applications and presents the most valuable findings concerning the efficient use of NPs in the drilling fluid industry. Based on that, different recommendations are stated. This might help researchers to better understand NPs' functionality in this area of application and promote using NPs-based drilling muds as cost-effective and environmental-friendly fluids to drill the Egyptian oil and gas wells.

Sustainable Manufacturing: Opportunities and Challenges

Dr. Hossam Kishawy

Associate Dean, Faculty of Engineering, Ontario Tech University, Canada

Abstract

The demand for decreasing the undesired impact of the manufacturing industry is increasing, as the world addresses the environmental influences on the society. In general terms, new lifestyle, new business model and new technology are the key parameters for building new sustainable world and this is particularly true in the manufacturing sector. Manufacturing being the key pillar of the society will be strongly affected by the sustainable issues and it will play a significant role in creating a sustainable way forward. Nearly most of the manufacturing models, of today, are based on the traditional principles. Therefore, manufacturing along with culture and economy pillars are expected to provide the tools and opportunities for building novel solutions towards building a sustainable manufacturing. To evaluate sustainable manufacturing performance, manufacturing sectors must formulate a set of measures in response to the growing sustainability concerns, aimed at integration of different sustainability aspects. The triple bottom line (TBL) of sustainability, which are environment, economic, and social dimensions are usually used to evaluate sustainability. A few studies have attempted to assimilate sustainability into manufacturing performance assessment. At the same time, there are no standard sets of sustainable manufacturing performance measures. Therefore, the current study aims to integrate sustainable smart manufacturing performance by incorporating sustainable manufacturing measures and discussing the current and future challenges that are faced by the manufacturing sector. In addition, the opportunities for future research including sustainable smart manufacturing are discussed and presented.

Computational Research, AI and the Digitized Economy: A look into the future

Dr. Abdel-Fattah S. Yousif,

Director, Advanced Research Computing, University of Calgary, Canada

Abstract

Computational research is the field of study in which mathematical models, computer science theories and High Performance Computing (HPC) infrastructure are used to investigate and solve scientific problems. Computational neuroscience and Bioinformatics are two examples where computational analysis and AI or Machine Learning (ML) models are used to analyse medical conditions through imaging or genome sequences. Such approach is leading the way for the digitization of customized medical operations and medicine.

Computational research is the leading driver of digitization across industries and economies. It deals with big data and deep learning AI/ML models and run on a extremely high throughput infrastructure to deliver the needed insights to perform a financially driven event, delivery of service or any actionable response to a given set of data.

This presentation provides examples of computational research applications in the industry, such as Healthcare, Engineering and Energy sectors. The presentation will cover parallel machine learning focused on employing high performance computing technologies to enhance the performance of advanced machine learning algorithms in AI deep learning frameworks. Scaling up such frameworks enhance the performance of insight-driven applications and enable discovery of complex high-level features of scientific models. This presentation provides general concepts on how HPC speeds up "scientific discovery" and provide real-time analysis of data (such as patient data or supply chain data).

The presentation will provide an overview of digitization and digital economy concepts. The impact of computational research on economies in terms of Gross Domestic Product (GDP) growth, job re-distribution and job growth will be discussed. In conclusion, we will provide a set of recommendations for areas in computational research in Egypt that could lead to new economic activities and potential job growth in impacted industries.

40

Blockchain-Based Architecture for Secured Data Storage

Dr. Tarek Saadaw

Director, Center for Information Networking & Telecommunications, City University of New York, City College, USA

Abstract

Background information: The proliferation of internet has made the use of database, especially cloud database, increased in recent years. This is because it is assumed that data stored in databases are secured and easily accessible. Most of efficient and effective data recording and storage databases use centralized approach. Rationale of Research: The security problems associated with existing centralized databases have made stored data more vulnerable to cyberattacks. More specifically, preventing issues like fake data injection, manipulation and deletion has become a great concern. Despite the efforts to combat these problems, most centralized database still suffers from cyberattacks such as single-point-of-failure or man-in-the-middle attacks. Hence, the need to prevent stored data and network against these attacks becomes pertinent. Purpose: We propose a blockchain-based architecture for secured storage of chemical and biological exposure history for individual. This architecture combats the security concerned associated with existing centralized approaches.

Objectives: The objectives of the proposed architecture are as follows:
•To propose an architecture that is resistant to database cyberattacks.
•To propose a blockchain-based architecture that automatically retrieves and record information about chemical and biological exposure of individual.
•To propose a blockchain-based architecture that verifies who updates the blockchain, hence, prevents malicious data injection.
•To propose a tamper-proof architecture that stored data are immutable.
•To propose an architecture that do not encrypt stored data which makes it easy for authorized users to read data without translation.
•To propose an autonomous architecture that updates database in real-time.
•To propose an architecture that can grant access to authorized users to view and make decisions based on stored information

Method: Unlike centralized approach, this architecture is distributive, tamper-proof and stored data are immutable. Devices that collect and record information about chemical and biological exposure of individual are set up as private blockchain network nodes. These devices collect exposure information, prepare them as transactions and mine into the blockchain. After the information has been mined to blockchain network, it cannot be erased or mutated (i.e. it is permanently stored in the distributive database). Relationship to other areas of study: The proposed architecture can be used to securely share classified data among authorized personnel.

Result: The performance of the architecture was evaluated by examining its resistance to fake data injection, manipulation and deletion. The result shows that the architecture is resistant to malicious data injection, data manipulation or deletion. Preliminary

41

Conclusion: We propose a blockchain-based architecture that can securely retrieve and store chemical and biological exposure history of individual. The performance of the architecture was evaluated against common database attacks. The result showed that it is resistant to these attacks.

Impact: If the proposed architecture is applied in cybersecurity cooperative intrusion detection system, it strengthens the capability of partners to detect and prevent cyberattacks which can avert wars.

Survey of Apache Spark Optimized Job Scheduling in Big Data

Walaa Ali Mohamed[a], Hanaa Torkey[b], Gamal Attiya[c]

[a]Computer Science Department,El-Gazeera High Institute for Engineering Technology, Cairo, Egypt

[b,c]Computer Science, Faculty of Electronics Engineering, Menofiua university
Cairo, Egypt

Abstract

Big data have acquired big attention in recent year. The spark framework become very popular for using in a distributed data processing. Spark is also analytic machine for big data processing with various modules for SQL, Streaming, Graph processing and Machine learning. Different scheduling algorithms vary with its behavior, design and also the goal that achieved to solve a problem like data locality, energy and time. This paper shows the outline of job scheduling, different modes using in spark, types of scheduler, existing algorithms with advantages and issues. In this paper, various adaptive ways to schedule jobs on spark and development algorithms to improve performance in Spark will be discussed. This paper present comparison between different scheduling algorithms, strength points and weakness points of them that aids the researchers understanding the scheduling mechanisms applied on spark used in Big Data.

Image authentication Technique based on advanced encryption standard (AES), Secure Hash Algorithm and steganography

Eng: Hosam Eldin Fawzan Elsyied

Assistant Lecture in Faculty of Engineering Collage at Sinai University

Abstract

Due to the widespread for digital imaging devices, forgery of digital media became more convincing. This led to increase interest in developing image authentication technique to prevent modification of images contents or duplication by unauthorized users. This paper proposes a model that uses encryption techniques Advanced Encryption Standard (AES-128) to encrypt the image content, Secure Hash Algorithm (SHA-1) and steganography. The aim of this model is Authentication the original image is embedding a dynamic code (watermark) to the image code to prevent attacker from tampering the image and to identify later whether they are forged or not. The evaluations of the hybrid model will be achieved by applying three different techniques to discover which one is better than other one. The three techniques are Least Significant Bit (LSB), bit number four and Most Significant Bit (MOS). This paper measures the image quality based on mathematical metrics.

Remote sensing technologies for sustainable developments

Ahmed shaker*, Hamdy Elsayed, Ashraf Elshorbagy, Yasmine Megahed, Ebraheem Alhomodi

Department of Civil Engineering, Ryerson University, Toronto, Canada

Abstract

Over the last decades, remote sensing technologies have been emerging to serve a larger scale of applications than ever before. The key reasons for that is the technological advancement in sensor manufacturing, the growth in solving computational complexities, and finally the accelerated movement in data fusion algorithms. It's worthy to mention that remote sensing systems was designed in the past primarily to be used onboard airborne and satellite systems to collect information about the earth surface and learn more about the changes of the planet. However, nowadays remote sensing systems is used in different environments; It is placed onboard manned and unmanned aircrafts, ground moving vehicles, and also being used in terrestrial (stationary) data acquisition platform. The continuous research and development in sensor technology including passive sensors such as digital cameras and active sensors such as LiDAR and RADAR sensors led to a greater capability, higher usability and more integrability to the end-user of the geospatial systems. This research work focuses on demonstrating the state-of-the-art remote sensing development in LiDAR sensor (including satellite, multi-spectral, and photon laser sensors) with an exposure on the use of LiDAR data in sustainable developments. Moreover, this research work presents data integration between the LiDAR data and other passive sensors such as the multispectral and hyperspectral sensor data. Those sensors provide high spectral and spatial resolution to enable anyone to leverage the benefits from each data source and fill into data gaps in each sensor side. This paper will conclude several remote sensing potential applications using laser scanning and multi/hyper-spectral technologies that will effectively contribute to the current and potential national projects and developments, and that ultimately will secure sustainable economy given the available limited resources.

Microbial Desalination Cells (MDCs): Performance Assessment and Potential Practical Applications for Wastewater Treatment

P.Eng.Mohamed Gamal El-Din

Killam Annual Professor, Donadeo Innovation Centre for Engineering, Environmental Engineering Program, Civil & Environmental Engineering Department, University of Alberta, Canada

Abstract

Microbial desalination cells (MDCs) have emerged as promising sustainable technologies as they have demonstrated ability to treat wastewater with simultaneous production of electricity. Microbial desalination cells integrate microbial fuel cell (MFC) process and electrodialysis for wastewater treatment, water desalination and production of renewable energy. A typical MDC unit consists of anode and cathode chambers, with an additional desalination chamber in between. The additional desalination chamber is constructed by inserting an anion-exchange membrane (AEM) and a cation-exchange membrane (CEM) on either side. MDCs can either be used as a stand-alone process, or can be combined with other desalination processes, such as reverse osmosis or electrodialysis. The main objective of this project is to study the different operational conditions affecting the performance of MDCs as well as the possibility to integrate some of the low cost locally manufactured materials in the operation of MDC. Through the MDC operation, the technical and economic feasibility will be examined. Possible practical applications of MDCc will also be examined.

Earth observations and data science addressing water issues in Egypt

Prof. Hesham M. El-Askary

Professor of Remote Sensing and Earth System Science, Chapman University, USA

Abstract

Research and innovation are nowadays, key transversal means to societal challenges that need to be addressed through an integrated approach. Ongoing global climate change, water scarcity, prolonged droughts, growing population, overexploitation of water resources, constructions on rivers, coastal and marine pollution, biodiversity decrease, development of blue economy and the intensification of economic activities are all pressing issues that affect water resources and cross different spatial and temporal scales. These water-related issues are becoming limiting factors for sustainable economic growth and require a collaborative and interdisciplinary approach, to foster innovative solutions. The cross-area nature of research and innovation theme is unique and important, hence should be utilized in current and future directives and policies to ensure better life for all and to achieve different sustainable development goals related to water resources. In this session we will touch on approaches for digital agriculture, and monitoring systems, recent advances in big data/machine learning in water related issues, predictive power on atmospheric phenomenon, how research and innovation is being used to evaluate and mitigate impacts of climate change on water resources, bridging of water, energy and food ecosystems in support of interconnected polices and international agreements and how remote sensing, earth observations and modeling can be used in coherency with other approaches and innovations

Utilization of deposited sediment in Aswan High Dam Reservoir

Dr. Tarek Abdel Aziz

Director of Survey Research Institute, National Water Research Center, Ministry of Water Resources and Irrigation, Egypt

Abstract

Prior to the construction and operation of Aswan High Dam (AHD), in 1964, 9-10 million tons of suspended sediment were deposited annually on the flood plains of the Nile, while about 93% of the total average annual suspended load of 134 million tons was carried out to the Mediterranean Sea. Since the full operation of AHD in 1968, the flood discharge of the Nile, downstream the dam has been greatly modified and more than 98% of the total suspended loads were retained within the reservoir. After about 51 years of operation, the accumulated deposited sediment in AHD reservoir reached to 7500 million m3. There are 1500 million m3 of sediment deposited in the Egyptian borders and 6000 million m3 in the Sudanese borders based on the last survey trips. Trapping of sediment reduced the quality of agricultural lands downstream AHD along the whole reach from Aswan till the end of two branches Damietta and Rosetta. Extracting of deposited sediment will increase the storage capacity for water instead of sediment. The extracted sediment can be transported to any agricultural or cultivated lands and definitely will improve its quality to high limits. Therefore determination of the amounts and distributions of sediment in the longitudinal and transverse directions in AHDR is needed. This is not only for getting reservoir capacity, but also for the utilization of these deposited sediments in the cultivated lands.

Design and development of a small scale vertical axis wind turbine

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Abstract

This paper presents a thorough review of wind turbine design considerations, and summarizes concepts required for wind turbines to supply useful power. Design specifications for vertical axis wind turbines (VAWT) are emphasized. VAWTs have several non-dimensional parameters that must be taken into account when attempting to design a wind turbine to achieve high efficiency, and these factors are discussed in this paper. Several case studies on VAWT wind turbines built and tested by a research team comprised of Manufacturing and Engineering Technology undergraduate seniors and two MS graduate students are provided. The paper outlines how the research team developed innovative design and analysis techniques to improve previous VAWT designs. This study identified one particular advantage of VAWT systems, i.e., they can accept the wind from any direction. This offers some design simplifications and eliminates the problem imposed by gyroscopic forces on the rotor of a HAWT as it tracks the wind. The vertical axis of rotation also permits mounting the generator and drive train at ground level. However, there are disadvantages associated with the use of VAWTs. For example, it is not practical to control power output by pitching the rotor blades, and they have a low tip-speed ratio.

Research and Innovation in Green Technology

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e. General Manger of Quality Control & Environment Department, Alexandria Water Company, Egypt.

Abstract

This study seeks to undertake laboratory-based to investigate formulations containing herbs (arghe) extract as a novel environmentally scale and corrosion inhibitor for simulated cooling water solution. Mineral scales were deposited from the brine solution by cathodic polarization of the steel surface at −0.9 V (vs. SCE) at 40o C. The used evaluation tools were conductivity measurements, chronoamperometry, electrochemical impedance spectroscopy (EIS) techniques, optical and scanning electron microscope (SEM) examination as well infrared spectroscopy (IR) examination to rank the efficiency of various formulations. Corrosion was deposited from the brine solution by cathodic polarization of the steel surface at −0.9 V (vs. SCE). The used evaluation tools were electrochemical impedance spectroscopy (EIS) techniques and potentiodynamic measurements. Intercomparison study between optimum dose of extract and 10% mix (Tri Sodium Phosphate+ Carbohydrazide) which used in petrochemical industry were carried out. The results clarify that, arghel leaf extract is more efficient as antiscalent and less efficient as anticorrosion than 10% mix (TSP+ Carbohydrazide). Arghel extract is environmentally friendly inhibitor and has low operating cost than mix of TSP and Carbohydrazide. It was recommended to use Arghel extract in the closed cooling systems to reduce the amount of water used in the cooling process.

The Role of Environmental Health in Attaining a Sustainable Development in Egypt

Dr Amer El-Ahraf

Past President, Association of Egyptian American Scholars, Past President, (US) National Environmental Health Association, Professor of Health Sciences and Vice President Emeritus, California State University, Dominguez Hills, USA

Abstract

Sustainable development is dependent on environmental sustainability which is integrally intertwined with the definition of environmental health (and its role in preventing environmentally related disease and disability as well as creating a health supportive environment that is necessary for the promotion of human health and well-being as illustrated in this paper.)A healthy population and a healthy environment are essential components of sustainable development. The definition of environmental health is such an important concern, that there are about thirty definitions as represented by those developed by the author and by various distinguished colleagues; and important international organizations and professional societies..(Additionally,

Important organizations and professional societies including the World Health Organization (WHO) and the National Environmental Health Association (NEHA) have published their own as well.) In view of the importance of sustainable development to any nation, and particularly to Egypt with its current ambitious program for economic development, a definition of environmental health that emphasizes environmental sustainability is essential. El-Ahraf and Hanson defined environmental health at two levels: conceptual and operational. On the conceptual level, the authors defined it as follows: " Conceptually, environmental health is defined as the field that represents the important interface between environment and health as well as the dynamic interaction between scientific development and social practice .On the operational level, the field has been identified by the same authors as: " Operationally, environmental health is defined as the field representing human daily needs and requirements for environmentally sustainable sources of safe food, water and shelter, clean air , waste disposal and land use management in order to prevent environmentally caused disease and promote well- being through health supportive residential, occupational and recreational environments where people live, work/study and play." Thus, in practical terms, the field of environmental health is concerned with the reciprocal relations between the health of the environment and the health of humans as well as optimizing such a relationship to achieve sustainability of development. Despite advances in human longevity and decrease in infant mortality worldwide, these gains are fragile because good human health requires good ecological health. The gradually worsening conditions of the natural environment and its support systems, worldwide, are alarming in view of the recognition of both the impact of the environment on public health and the recently recognized reciprocal relations between personal health care and the environment. And, herein lies the significance of the field

of environmental health and the need for a new definition that acknowledges the importance of environmental sustainability and sustainable development along with traditional concerns of the field in both developed counties such as the United States and developing nations such as Egypt. Issues raised in this paper are not only addressed from a scientific and field practice points of view, but, also from an ethical point of view where environmental stewardship is a major consideration in maintaining a sustainable development.

Detection of Islanding Phenomenon for Renewable energy systems

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Abstract

The advancement in new technology like fuel cells, wind turbines, and photovoltaic cells and new innovations in power electronics to satisfy customer demands for better power quality and reliability are forcing the power industry to shift to distributed generations. Hence distributed generation (DG) has recently gained a lot of momentum in the power industry due to market deregulations and environmental concerns. Islanding occurs when a portion of the distribution system becomes electrically isolated from the remainder of the power system yet continues to be energized by distributed generators. An important requirement to interconnect a DG to power distribution system is the capability of the DG to detect islanding. Failure to trip islanded generators can lead to a number of problems to the generators and the connected loads. The current industry practice is to disconnect all distributed generators immediately after the occurrence of islanding. Typically, a distributed generator should be disconnected within 100 to 300 ms after the loss of the main supply. To achieve such a goal, each distributed generator must be equipped with any islanding detection method. In this paper, active methods have been introduced to overcome this problem as it can detect islanding easily and has a small Non-Detection Zone (NDZ), but unfortunately it degrades the power quality of the system.

Exploring Inclusiveness in Green Hotels For Sustainable Development In Egypt.

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Abstract

Universal Design (UD), "Design For All", and "Inclusive Design" are all different designations of approaches which concentrate on the availability of environments, products, facilities, programs, and services to the broadest range of the users' abilities, ages, reading levels, learning styles, languages, and cultures. (UD) is a design process that enables and empowers a diverse population by improving human performance, health and wellness, and social participation. Its key principles are simplicity, flexibility, and efficiency. UD is not a synonym for accessibility. Accessibility mostly indicates minimum compliance with codes and standards for disabled people.

The Green Pyramid (GPRS) is a national system to classify green building, also the Green Star Hotel (GSH) is a national green certification and capacity-building program managed by the Egyptian Hotel Association (EHA). This study focuses on Green Star (GS) Certification which seeks to achieve sustainability and environmental consciousness. Besides, universal design (UD) which targets to accomplish sustainability in the built environment.

Egypt's Sustainable Development Strategy (SDS), Egypt Vision 2030, is in line with Sustainable Development Goals (SDGs). The national strategic plan's three dimensions (economic, social and environmental) are based on ten pillars covering broadly the SDGs. Both (UD) and (GSH) are in support of sustainable development (SD) in terms of "environmental protection" and social justice/ "inclusion". This paper aims at accomplishing sustainable development (SD) 2030 in Egypt for a better life to all Egyptians by investigating the inclusiveness in green star certified hotels. The study focuses on "Three green star certified hotels" as case studies to be evaluated in terms of the Universal Design Features to achieve (SD) in Egypt. A checklist is prepared for that purpose and is applied to the chosen hotels. As a result, an evaluation is made and the conclusion is given in the paper.

Magnetized water: New green technology tool for improving Egyptian agriculture sector

Mahmoud Hozayn Mahmoud

Prof., and Vice president of Agricultural & Biological Research Division National Research Centre, Giza, Egypt.

Abstract

Egypt's agricultural sector is facing a major challenge to produce more food with less amounts of fresh water or use low quality of water, especially under scarcity of fresh water and/or decreasing quality of water in many regions included Egypt. Agricultural sciences take an interest not only in the common and valued crop-forming factors, but also in those less expensive and generally underestimated, though more pro-ecological ones, such magnetic fields. The water treated by the magnetic field or pass through static magnetic units called magnetized water. There have been many investigations on the effects of low frequency electric and/or magnetic fields on plants. Magnetic field was shown to induce seed germination, reproduction and growth of the meristic cells and chlorophyll quantities, plant growth and development, the ripening, yield and quality of different crops. Moreover, data recorded from these studies showed that, decrease of soil alkalinity, increase in mobile forms of fertilizers and reduction of scale in irrigation pipe. During 2010-present, Many field trials using some field crops (i.e., wheat, braly, Zea maze, sorghum, faba bean, chick-pea, lentil, mung bean, sunflower, canola, flax, sugar beet, Egyptian clover, alfalfa, onion, potato ect..) were conducted under normal and salinity stress (soil and/or irrigation water) conditions in three locations, Egypt. The results showed a significant positive effect of magnetic treatment (ether for seeds and/or water) on the most of studied parameters (i.e., germination, growth, yield and yield components, yielded seeds quality. The percent of increases in economic yield (ton ha-1) in response to sowing with primo-magnetic seeds and irrigation with magnetized water application ranged from 8.25 to 80% according to tested crops as compared with control. As well as water use efficiency was improved at all crops. Regarding the above acceded results and indisputable we are expected wider implementation in the agricultural production especially under salinity stress conditions

Crowd-Sensing based Road Information System

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Abstract

Next generation intelligent transportation systems (ITS) of future road traffic monitoring will be required to provide reports of traffic congestion, road conditions, and driver behavior. Monitoring road surface conditions benefits drivers and the community. Road surface anomalies contribute to increased risk of traffic accidents, reduced driver comfort and increased wear of vehicles. Modern automobiles are already equipped with an abundance of technologies: GPS for navigation purposes; inertial sensors (accelerometers and gyroscopes) that monitor vehicle dynamics; vision and radar sensors for blind spot display; proximity sensors and lane departure warning systems.

Our research group devised a system for intelligent sensing for drivers, which we called iDriveSense. iDriveSense integrates vehicular and smartphone sensors within and amongst vehicles to provide robust road monitoring, driver profiles and route recommendations. Smartphones used inside land vehicles acquire data from the vehicle's onboard sensors (through wireless connections such as bluetooth) and synchronize it with its own measurements of acceleration, angular rotation, and heading. This data is then filtered, processed, and sent to a road information system (RIS) cloud where it is used to build road and driver information repositories. Robustness is achieved through calibration and cross-referencing on two levels: a driver level and a cloud multi-driver level. We developed techniques for learning driver competence and route preferences.

While iDriveSense can benefit from the prevalence of sensors and processing in intelligent connected vehicles, it is intended for use with current automobiles in the market as well. These represent 71% of drivers who do not own vehicles with built-in connectivity but still desire the road and traffic services provided by such connectivity. iDriveSense transforms the vehicle into a smart node capable of providing vital information for road safety. Our solutions are not intended to replace existing RIS installations and/or navigation systems, but rather provide such systems with real-time robust information that can significantly improve the services they offer. Our research created unique design and integration specifications and new service and information management techniques, as well as algorithms to facilitate a real-time, ubiquitous RIS. The deployment of our research will contribute to reducing congestion and accidents on roads, enabling road labeling based on accessibility and conditions, providing personalized alerts and route recommendations, and improving road safety for all drivers.

Recent Advances in Accelerated Bridge Construction (ABC)

Dr. Khaled Sennah

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Abstract

The use of prefabricated elements and systems in bridge construction has recently been the subject of much attention and interest amongst bridge jurisdictions in North America as a way of improving bridge construction and replacement of deteriorated bridges. Through mass production of the materials, the repeated use of forms, reduction of on-site construction time and labor by concentrating the construction effort in a fabrication facility rather than at the bridge site, significant economic benefits can be achieved. Issues related to work zone safety and traffic disruptions are also a major concern. A full-lane closure is very costly in busy urban highways because of the significant economic impact on commercial and industrial activities. As a result, prefabricated bridge technology is seen as a potential solution to many of these issues. Prefabricated elements and systems can be quickly assembled and could reduce design efforts, reduce the impact on the environment in the vicinity of the site, and minimize the delays and lane closure time and inconvenience to the traveling public, saving time and tax payers' money. Even at a higher initial cost, the use of prefabricated systems on bridges subjected to a high volume of traffic may be justified because excessive lane closure times can be avoided. This lecture presents the current state-of-the-art approach to the use of innovative prefabricated systems and elements in modern bridge construction. A summary of most recent ABC Guidelines and Specifications in Canada and USA will be covered. Also, the presentation will cover a variety of precast concrete girders, full-depth deck panels, abutment, piers and pile caps used to accelerate bridge construction. Moreover, a few of the latest precast connection details that have been implemented in Canada and USA using ultra-high performance fibre-reinforced concrete (UHPFRC) as connection filling material and non-corrosive glass fibre reinforced polymer (GFRP) bars as deck slab reinforcement will be covered.

Practical Challenges in Delivering Infrastructure Rehabilitation Projects

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[c] University of Waterloo, Canada

Abstract

Public-Sector organizations such as Municipalities, School Boards and Universities are struggling to keep their aging facilities operational and reducing the large backlog in infrastructure renewal needs. The cost to bring school and university facilities to acceptable functional levels in Ontario (Canada) is estimated to be as high as $15-billion and $2.6-billion, respectively. Significant efforts in the literature focused on determining efficient rehabilitation programs, little efforts, however, addressed the delivery phase of such projects. Existing project management and delivery systems exhibit serious drawbacks when applied to infrastructure renewal projects that are mainly scattered and repetitive in nature. Infrastructure rehabilitation projects are repetitive in nature and scattered across large geographical areas (schools, buildings, etc.). However, considering every site separately deprives these organizations of benefiting from repetitiveness and minimizing the impact of the scattered nature. Furthermore, the current project management systems are not suitable to address the challenges of scattered repetitive projects. Moreover, the control aspect of these systems is lacking and therefore, identifying and implementing corrective actions during constructions is a very challenging task. This paper investigates the unique characteristics of infrastructure renewal projects through a field study of the practical challenges encountered by two large public organizations (school board and a university) in delivering this type of projects. The current project delivery methods utilized to deliver this type of projects are discusses and their drawbacks are identified. Accordingly, the requirement in proper project delivery method to complete these projects in a timely and in cost efficient manner are identified.

Smart practices of biodiversity, present and future of ecosystem Educational Approach

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Abstract

The current article aims to reveal the reality of crises that currently threaten the ecosystem and how smart practices can be seen to emerge from these environmental threats in the near and far future. This will promote the global biodiversity policies and pass them for a safety and more participatory future. The article also emphasizes that smart practices are not enough, but more policies and continued international supervision of all poor, developing and developed countries in order to participate in solving most of the problems related to the ecosystem. The article also focused on developing future smart practices to reduce desertification, reduce greenhouse gas, reduce water shortages and reduce early fishing, reducing malnutrition, reducing the energy crisis.

The Future smart practices have been built according to the global biodiversity reports since 2011, which aim to preserve the environment and the green economy, take care of the natural resources of the world's peoples, and invest them in better ways to maintain life, security and stability. European initiatives have also stressed the imperative of effective cooperation between countries aimed at social peace and achieving the 2030 Sustainable Development Goals.

Thus, the article tried to answer the following questions:
- What is the reality of the ecosystem crisis?
- What are the most important reports on biodiversity threats?
- What are the proposed smart practices for treating biodiversity threats in order to life preservation?

Findings

SP (1) desertification reduction

Eliminating the problem of desertification requires the identification of more than one area of afforestation and green areas within each country that has world-class specifications and the agricultural land is characterized by diversity and fertility quality under the supervision of a United Nations World Agricultural Committee representing all member states to preserve the ecosystem.

SP (2) global warming reduction

To get rid of the problem of global warming is by using renewable and alternative energies for diesel, which leads to higher air pollution and increased ozone hole. This emphasizes the need to be aware of the use of solar energy and natural gas and to look for more energy that do not cause harm to the environment, and increase the proportion of Oxygen in the atmosphere with the large number of green areas.

59

SP (3) water shortage reduction

Lack of water despite the flow of river water and seas indicates that there is an imbalance in the use of water resources, which is the lack of care for the cleanliness of the seas and rivers and the optimal investment to generate more eyes and water wells next to the seas, rivers and oceans, fruitful drilling increases the water eyes and work on Its run by providing suitable motors to maintain it. This is under international supervision after the use of remote sensing sensors to detect areas capable of drilling wells and eyes within each country, with continuous follow-up and awareness to conserve water through education and media.

SP (4) early fishing reduction

Fish farms are necessary to provide continuous monitoring by countries. The provision of alternatives to protein and phosphorus provided by fish can be in the cultivation of vegetables and fruits that are of the same benefit as fish to reduce early fishing of the small fish.

SP (5) malnutrition reduction

New prospective at the equal distribution of agricultural seeds and grains in all countries of the world enables each country to grow all agricultural crops with fertilizers for land fertility and medical supervision. In other words, it is an illusion to think that no country can grow a particular crop. The problem is the scarcity of seeds in one country and its availability in another.

The same is true for livestock and poultry; the circulation of livestock and poultry between countries and the provision of the right environment for breeding contributes in turn to the elimination of many diseases and epidemics that occur due to the scarcity of livestock and poultry of the same quality as they are found elsewhere.

SP (6) energy crisis reduction

Addressing the energy crisis and wasting it comes with the provision of renewable resources from nature such as sun, water and natural gas, as the rationalization of electricity comes from productive work in the sunlight, electric lighting is after the absence of the sun as technological devices are used working with alternative resources other than electricity such as Charged batteries, solar and so on……

Artificial Intelligence Tracking of Healthcare using Social Networks

Adel S. Elmaghraby

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Abstract

In this talk, I would cover the value of tracking social network interactions, in particular tweeter, for various health-related topics using Artificial Intelligence (AI). This type of analysis would allow us to recognize the perception of tweeter users in various locations while tracking changes over time. This work is part of a larger project to have multi-lingual analysis and to integrate health perception with health-related data and literature. The AI techniques used include NLP and ANN. A system that was developed used a combination of unsupervised and supervised algorithms to track the trends of health-related topics in social media. The system captures the correlation of words based on the context to detect the trending topics. The supervised algorithm implemented is a Convolutional Neural Network (CNN) in conjunction with the Word2Vect model to classify and label new tweets, assigning a feedback to the topic models. Our results compare positively with two state of the art techniques demonstrating an advantage that can be leveraged for further improvements.

Optimizing Emissions from Business Employees Sharing Multiple Work Locations

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Abstract

The transportation sector has been dealing with several challenges including the unstable and high cost of energy, GreenHouse Gas (GHG) and air pollution emissions, expensive parking costs, and congestion. In the United States, the transportation sector is reported by Environmental Protection Agency (EPA) as the largest source of GHG emissions at 28% and the fastest growing sector in energy consumption. To support addressing these challenges and improve efficiency of the transportation sector, new models to reduce emissions, travel time, cost while maximizing health benefits and savings are highly needed. This study presents the development of an innovative systems called, Multi-Business Commute Optimization System (MBCOS). MBCOS have two integrated components: (1) Geographical Information System (GIS); and (2) optimization model. The GIS is designed to calculate travel parameters, including travel time and distance, transportation emissions, and energy demand for transportation modes such as drive alone, carpool, public transit use, bike, walk, and combinations of these modes. The optimization model is designed to identify optimal commute plan for each employee in a business to minimize GHG and air pollution emissions while complying with commute needs and preferences of employees. A case study employees at Fresno County is analyzed to evaluate the system performance and demonstrate its use. The results showed that the developed system is capable of reducing the total GHG and air pollution emissions by 23.4% as compared to the existing commute behavior.

Optimization Model for Repetitive Construction Projects with Multiple Crews and Multiple Options of Construction Methods

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Abstract

Repetitive construction projects are characterized by a number of work packages that are repeated over the construction period. Traditional construction scheduling methods such as Critical Path Method (CPM), bar chart, and Program Evaluation and Review Technique (PERT) are inefficient in scheduling these types of projects. These methods focus on activities duration and job logic while ignore crew work continuity. Maintaining crew work continuity can improve efficiency of planning repetitive construction projects due to learning curve effect as well as reduction of idle time and interruption. Linear Scheduling Method (LSM) is designed to maintain crew work continuity while planning repetitive construction projects and complying with project constraints such as budget and deadline. This paper presents the development of an exact optimization model based on LSM for planning repetitive construction projects with multiple crews and multiple techniques for constructing activities. The model is developed in four steps: (1) identifying decision variables; (2) formulating objective function; (3) formulating constraints; and (4) implementing model computations. The start time of each activity at each unit, number of crews for each activity, idle crew cost during the entire project, as well as techniques for construction activities are modeled using decision variables. The objective function is designed to minimize the summation of direct cost of activities, cost of adding crews, and idle cost of crews during the entire project. Several constraints are integrated in the model to ensure practicality of the identified solution. The computations of the model are executed in MATLAB®2019a using mixed integer linear programming (MILP) solver of Gurobi. To evaluate the model performance and demonstrate its use, a case study consisting of 100 repetitive units is analyzed. The optimization model was capable of identifying optimal schedule of the project in reasonable computational time.

Effect of Processing and Alloy Composition on Microstructure and Wear Resistance of α/β Titanium Alloys for Aviation Applications

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Abstract

Alpha-Beta titanium alloys are used worldwide for aviation industry. Among this group of alloys, Ti-6Al-4V (Ti64) alloy is the most commercially used alloy. Recently, Ti-6Al-7Nb (Ti67) alloy which is also an alpha/beta alloy has been developed to replace the commercial (Ti64) in several applications. However the presence of Nb as beta phase stabilizing elements instead of V may affect the alloy performance. In the current research, the influence of the processing method along with the alloy composition on the surface properties of both Ti64 and Ti67 alloys were investigated and compared to each other. It was observed that the thickness of alpha case formed in Ti64 after oxidation at (900-1100 o C) was greater than in Ti67. In addition, the equiaxed microstructure of the forged samples showed thicker alpha case than the widmanstätten microstructure of the cast samples for the two alloys. Both forged and cast Ti64 showed significant improvement in dry sliding wear resistance after thermal oxidation at (900 °C and 1100 °C), while alloy Ti67 showed less improvement in spite of the improved surface hardness. These results should be well considered when replacing Ti64 by Ti67 alloy for aviation industry.

30 years success story of casting technology at CMRDI

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Abstract

Casting technology department at Central Metallurgical R&D Institute (CMRDI) was established in 1989 through international cooperation with TNO agency in the Netherlands. TNO provided the casting department at CMRDI with a complete foundry pilot plant. The foundry shared in development the casting technology in Egypt as well as the Arab countries by applying training courses in most Egyptian foundries and upgrading the technical capabilities of the foundrymen since 1990. The foundry pilot plant at CMRDI contains different size of induction furnaces starting from 10 Kg to 350 Kg capacity. During the last 30 years, the foundry pilot plant at CMRDI produced huge numbers of special spare part castings that can not be easy produced locally in Egypt because they need advanced casting technology. CMRDI transferred this advanced casting technology to the Egyptian foundries for producing such spare parts locally in Egypt. CMRDI produced also spare parts that made of advanced materials such nickel-based alloys, titanium alloys and magnesium alloys, etc. One of the main strategic targets of CMRDI is to limit the imported spare parts by producing an alternative one at CMRDI or at the Egyptian foundries under the supervision of CMRDI. CMRDI gained advanced experience in casting technology through the international cooperation with research centers and universities in USA, France, Germany, Japan, Canada, Belarus, etc. Hence, this paper aims at showing the capability of casting technology department at CMRDI for producing spare parts as alternative to the imported ones during the last 30 years.

Renewable Energy Production from Municipal Solid Wastes: Current Status and Techniques for Improvement

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Abstract

Energy and water security will continue to rank among the world's biggest challenges in the coming decades. Anaerobic digestion (AD) of waste for biogas production can be a sustainable source of biogas production as well as an efficient waste management technique. Biogas produces renewable heat, electricity, and pipeline quality gas that can be used for transportation. However, AD is limited by a number of factors including the slow breakdown of complex organic waste. Therefore, significant efforts have been done and still going on to enhance the AD process performance.

In AD, the rate limiting process is the hydrolysis step, which can be accelerated through pretreatment. Various pretreatment methods (thermal, chemical, biological, mechanical) have been used to overcome the slow breakdown of complex wastes. This presentation will cover the role of pretreatment technologies of different feedstocks (thickened waste activated sludge, hog manure, primary sludge, source separated organics), and their effect on both fermentation and digestion processes. Different pretreatment technologies such as ultrasound, thermal hydrolysis, peroxide regenerated iron for digester enhancement (PRIDE), and free nitrous acid will be discussed. Furthermore, the effect of pretreatment technologies on single-stage AD versus two-stage AD will be discussed.

Green Star-shaped Polymeric Membrane for Water Treatment

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Abstract

Use methods and materials that have a high probability of realization and very feasible. The research program can be subdivided into the following phases) Precision synthesis and characterization of controlled and architecturally-diverse star-shaped polymers with high molecular weight and unique properties new approach, ii) Assembling of new amphiphilic hybrid materials by combing the star-shaped polymers with the natural guar gum as a membrane surface modifying agent, iii) Development of novel organic-inorganic hybrids scaffolds, iv) Fabrication of these smart materials based on guar gum to mixed-materix membranes (MMMs) prototypes, v) Experimental investigations aimed at understanding and controlling the morphology of pores in the fabricated MMMs, as these pores control the separation characteristics of the membrane , and vi) Capping and fabrication of silver nanoparticles (AgNPs) with appropriate functional groups and incorporating them into a polymeric matrix to demonstrate their application as antibacterial coatings for disinfection of water microorganisms vii) Applications of mixed-matrix membranes (MMMs) for wastewater treatment on lab and pilot scales. The overall goals of the study are to have cost-effective and environmentally friendly wastewater treatment technology for removal of pollutants such as heavy metals, dyes and disinfection of microorganism.

Converting the conventional activated sludge treatment system to tertiary treatment using an innovative hybrid system "Full-scale case study"

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Abstract

This study is a collaborative work between Housing and Building National Research Centre (HBRC) and the University of Alberta (U of A). It includes the enhancement of performance of the existing conventional activated sludge wastewater treatment plant to be a tertiary treatment to continue the second stage of this investigation in parallel with typical U of A pilot plant to optimize the performance of HBRC & U of A modified hybrid system under realistic Egyptian operating conditions. Which included contact, final sedimentation, stabilization and thickening tanks respectively with two returns sludge in this system one of them to contact tank and another to stabilization tank. Then observe the uptake and release of total phosphorus by achievement through two batch test using sludge samples from thickener and final. The first stage of this investigation was indicated that the inclusion of an anoxic tank for the denitrifying EBPR process increased the efficiency of P removal by reducing the amount of nitrate entering the anaerobic tank, which led to increased P removal of 67.9–78.6%. on the other hand, the results showed the system was very effective at removing both COD (>88%) and NH4 +-N (>96%).

Reduction of Pollution Load into the Receiving Environment in Enhanced Primary Treatment of Municipal Wastewater under Wet Weather Flow Conditions

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Abstract

As part of enhanced primary treatment (EPT) for primary influent (PI) wastewater under wet weather flow, coagulation/flocculation/sedimentation conditions were investigated at bench and full-scale levels. Process control indicators were also assessed for a comprehensive study to determine the most effective EPT operation conditions that could reduce the pollution load into the receiving environment. Three metal-based coagulants were studied, including aluminum sulfate (alum), ferric chloride (FeCl3) and polyaluminum chloride (PACl) with different combinations of cationic and anionic polymers. Low coagulant doses consistently demonstrated high removal ratios of macropollutants, while the impact of mixing conditions varied with the pollutant. Both Al-based coagulants had comparable performances that exceeded FeCl3. As such, 1 mg of Al added as alum (50 mg/L) operated best at low level rapid and slow mixing as it removed around 22 NTUs, 19 mg of chemical oxygen demand (COD) and 0.8 mg of ortho-phosphate (ortho-P). The highest total suspended solids (TSS) removal ratio was obtained at high level rapid mixing conditions. Bench and full-scale data showed comparable patterns of macropollutants reduction. Turbidity and % UVT exhibited good correlations with TSS and ortho-P respectively, which hints to the importance of monitoring turbidity and UVA for online process control as well as for the prediction of alum dose and micropollutants removal.

Classification of Medical Ultrasound Transducer Using Neural Network.

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Abstract

Diagnostic medical ultrasound makes a significant contribution to patient care and is Increasingly used in a variety of clinical settings by many different professionals with varying technical backgrounds (e.g. hepatocellular carcinoma). Therefore, the importance of ultrasound quality control is not only necessary for patient and operator safety but is also essential for maintaining the performance of the equipment to the highest-level achievable and it is required by various regulatory and accrediting agencies. Ultrasound image degradation originates primarily from transducer defects and potentially undermines reliable image interpretation. The ultrasound probe in-air reverberation pattern is used in routine quality assurance. We produce a quantitative quality control based on in-air reverberation images. They are easily generated for any probe independent of the level of expertise of the operator. The results are available to the sonographer prior to clinical use and transducer status can be remotely monitored with trend analysis over time. The method presents a scheme for the classification of normal functioning and defect transducers Region of Interest selected "ROIs" of 65 probes based on texture analysis that automatically detects in-air reverberation regions and recognizes them as normal functioning and defect transducers. However, feature selection is done by Twin Support Vector Machine. The accuracy of these features in distinguishing normal functioning and defect transducers has been evaluated by artificial neural network, and linear support vector machine algorithms classifiers. From the analysis of results, it was found that artificial neural network classifier gave an overall classification accuracy of 98% with 98% sensitivity. The results show that it is feasible to identify defect transducers based on texture features extracted from in-air reverberation ultrasound images. This method is shown to be useful for increased accuracy and increased speed for classification of functioning and defect transducers for improving the quality assurance of ultrasound.

Portfolio Assessment in Medical Education

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Abstract

A student portfolio is a compilation of academic work and other forms of educational evidence assembled for the purpose of (1) evaluating coursework quality, learning progress, and academic achievement; (2) determining whether students have met learning standards or other academic requirements for courses, grade-level. Portfolios come in many forms, from notebooks filled with documents, notes, and graphics to online digital archives and student-created websites, and they may be used at the elementary, middle, and high school levels. Portfolios can be a physical collection of student work that includes materials such as written assignments, journal entries, completed tests, artwork, lab reports, physical projects, and other material evidence of learning progress and academic accomplishment, including awards, honors, certifications, recommendations, written evaluations by teachers or peers, and self-reflections written by students. Portfolios may also be digital archives, presentations, blogs, or websites that feature the same materials as physical portfolios, but that may also include content such as student-created videos, multimedia presentations, spreadsheets, websites, photographs, or other digital artifacts of learning. Portfolios with a closed structure are highly comparable while portfolios with open structure allow learners to display their individual learning trajectories and comprehensions. The following arguments are often made by educator.: Student portfolios are most effective when they are used to evaluate student learning progress and achievement. Portfolios can help teachers monitor and evaluate learning progress over time. Portfolios help teachers determine whether students can apply what they have learned to new problems and different subject areas. Portfolios can encourage students to take more ownership and responsibility over the learning process. Portfolios can improve communication between teachers and parents. While portfolios are not generally controversial in concept, it's possible that criticism, and debate may arise if portfolios are viewed as burdensome, add-on requirements rather than as a vital instructional strategy and assessment option. Portfolios may also be viewed negatively if they are poorly designed and executed, if they tend to be filed away and forgotten, if they are not actively maintained by students, if they are not meaningfully integrated into the school's academic program, if educators do not use them to inform and adjust their instructional techniques, or if sufficient time is not provided during the school day for teachers and students to review and discuss them. Many advocates would argue, however, that portfolios are not intended for use in large-scale evaluations of school and student performance, and that they provide the greatest educational value at the classroom level where teachers have personal relationships and conversations with students. In conclusion, how portfolios are actually used or not used in schools, and whether they produce the desired educational results, will likely determine how they are perceived. Creating, maintaining, and assessing student portfolios can also be a time-consuming endeavor.

71

Study Gut Microbiota in HCV Patients Responders and Non Responders

Prof. Reda El Badawy

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Abstract

Background & Objectives: Still there is percentage of HCV patients not responding to Direct Antiviral Agents (DAAS), even the responder HCV patients needed to follow up. Gut flora (Microbiota) include all the microorganisms in the intestine and Liver can be greatly affected by changes in gut microbiota. The study done to evaluate the association between gut folra and the response to DAAS in chronic HCV patients. **Methodology**: Two groups ,group 1(No=15 of HCV responders patients) and group 2(No=15 non responder HCV patients) treated by DAAS according to the treatment protocol of the Egyptian National Committee for Control of Viral Hepatitis (NCCVH). Healthy control subjects (No=15)as third group age and sex matched compared to of HCV patients . All investigations were done plus stool culture using **VITEK 2 KITS** according to the manufacturer. **Results**: The results show statistically significant difference between the patients (responders and non responders) and control ,where **p1** comparison between contro and responders **,p2** between control and non responders,**p3** between responders and non responders. **Enterobacter organism** in p2,p3 was <0.001&<0.005 respectively .**Proteus and Clostridium perfringens** in p2 was 0.009,0.04 respectively .**Klebsiela organism** in **p1,p2** was 0.04 and 0.01 respectively while **Streotococci** in p2 was 0,007 . **Conclusion:** Gut microbiota have a crucial role in HCV patients specially the non responders compared to the control even the responders need to be followed up to adjust the gut flora of them to the normal because this proved to play an important role in micro environmental changes that lead to hepatocellular carcinoma(HCC).

Conservation of Posidonia oceanica (L.) Delile in the coastal habitat, western Mediterranean region, Egypt

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Abstract

Posidonia oceanica is endemic to the Mediterranean Sea and the most widespread seagrass species in these waters. It covers between 25,000 and 50,000 km2 of the coastal areas, corresponding to 25% of the sea bottom at the depth between 0 and 40 m. It has been called "the lungs of the Mediterranean" because it is one of the most important sources of oxygen provided to coastal waters. Posidonia   population produces 14 to 20 liters of oxygen per square meter every day.

Among their many functions, Posidonia oceanica meadows play a part in stabilizing seabeds, breaking swells and waves, and encouraging the deposit of sedimentary particles (Boudouresque et al., 2006). Posidonia leaves, which can be over 2 meters high and up to 20 meters wide, also form compact and resistant structures along shores that provide a very effective protection against erosion. In addition, the Posidonia habitats have a significant role as a carbon sink, absorbing carbon dioxide, storing carbon at an average rate of 83 g C/m² per year, and helping to alleviate the effects of climate change. Posidonia is an indicator species of the overall quality of coastal waters since it is very sensitive to pollution and can only grow in clean unpolluted waters. It supports a wide variety of animal species that use these habitats for breeding, feeding and shelter. It cover the sea floor and creates an ecosystem of great beauty, making possible leisure activities such as scuba diving and snorkeling.

 Populations of Posidonia are declining in many parts of the Mediterranean because of pollution, coastal development, fishing activities, and the mooring of ships that sweep the plants with their anchors and chains.

 Despite international legislation to protect Posidonia at the European level (Bern Convention), this important aquatic plant is in grave danger of disappearing in the next few years .The overall decline has been measured as approximately 10% over the last 100 years (Pergent et al. 2009), but a recent analysis of area coverage indicates a 34% decline in distribution area or degradation in the past 50 years (Telesca et al. 2015).

Many projects are being carried out to protect Posidonia in the Mediterranean such as: The Consell de Formentera and the Balearic Government in Spain have launched the

campaign "Save Posidonia'', a pioneering project in the western Mediterranean to raise awareness of the vital importance of Posidonia and raise funds to save it from extinction.

A project has implemented in 4 Mediterranean countries (Algeria, Libya, Tunisia and Turkey) to inventorying, mapping and monitoring of Posidonia meadows in The Med Posidonia Project (2006-2008).Another one (MEDKEYHABITATS , 2013-2016) mapping key marine habitats and promoting their conservation in Mediterranean countries .

Yet, no conservation program to protect marine ecosystem and to preserve Posidonia and coastal habitat in Egypt is implemented .The status of this plant ,which is endemic in the Mediterranean basin, and Last IUCN report assessed in July 2013 refer to that need of conservation action to protect this species

and initiation and establishment of protection sites for this population is a must.

The present study aims at survey sites of presence of the Posidonia populations and monitoring their density to make a key map for the species, studying the factors affecting its decline in Egypt and establishing a special sites for protection and implementing of protection measures and conservation program for this natural resource in Egypt. It also aims to make awareness program to increase the knowledge and the conservation of the marine biodiversity in our country.

Is Reticulocyte Hemoglobin Content a Sensitive Index of Iron Status

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Abstract

Objective: to evaluate the significance of reticulocyte hemoglobin content (rHC) in prediction of iron deficiency (ID) and diagnosis of iron deficiency anemia (IDA) and compare its sensitivity with transferrin saturation (TSAT)

Subjects and Methods: Thirty children with iron deficiency (serum iron level <55 µg/dL) and thirty children with iron deficiency anemia (hemoglobin level ≤11 g/dL) were enrolled and compared with thirty one healthy children. They were subjected to complete blood count, reticulocytic count, CRP, serum iron, ferritin, transferrin, total iron binding capacity (TIBC), rHC and TSAT. Oral iron therapy for iron deficiency and iron deficiency anemia and were followed up after eight weeks

Results: Lower significant Level of rHC and TSAT were found in IDA and ID. rHC was positively correlated with their detected studied blood indices (Hb, HCT, MCV, MCH). Lower significant TSAT values were found in ID cases than control but rHC not . Using ROC curves, the cut-off value of rHC and TSAT for detecting IDA or ID was 28.1pg/dl and 22 respectively. The AUC of TSAT was 0.957 with sensitivity 95.7%, which exceeded that of rHC 0.569 with sensitivity 50%, for detecting ID state. After iron therapy for 8 weeks, there was a significant increase of rHC in IDA but not in ID cases. While there was a significant increase of TSAT in both IDA and ID cases

Conclusion: For diagnosis of ID and IDA , rHC and TSAT are sensitive performance tool and highlights the difference of sensitivity of both as a diagnostic for ID state . It indicates TSAT is superior to rHC as a predictor of ID and prognostic for iron therapy. It recommends future prospective longitudinal study to confirm the use of rHC and TSAT as primary screening test for ID state.

75

Study the prevalence of Non Alcoholic Fatty Liver Disease among Banha University employees

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Abstract

Background   & Objective: An emerging concern is the apparent onset of significant for Non Alcohoic Fatty Disease(NAFLD) in early life at age of 20th even earlier .The major complications hepatic and extrahepatic especially on the CVS with high mortality to youth Aim of the study to evaluate the prevalence of NAFLD among Banha University employees ,its complications and associated risk factors. **Methodology**: This is cross sectional study at Banha University Hospital among employees, age of the subjects from 20-60 years old both males and females All investigations done, Abdominal Ultrasound and Doppler on external carotid artery. Exclusion of viral as well as autoimmune liver disease done.Liver FattyAcid Binding protein (LFABP) is unique novel biomarker   for fatty liver,its complications was done by ELIZA. Results: Prevalence of NAFLD was 56% and the complications like Carotid Intimal thickness > 1.1cm (CIMT) that mean early sign of atherosclerosis. Fatty pancreas was present in 45%,both fatty liver and fatty pancreas was 53%.The risk factors was 7 risk factors statistically significant ranged from (<0.036 to <0.001) correlated with this high prevalence of fatty liver among employees and these factors includes age,45years old, residency in urban area,, DM, hypertension, BMI>30kg/m2 .Alkaline phosphates and GGT. No statistical significance as regards sex other liver functions like ALT and AST between the 2 groups.LFABP level (0.29-6ng/ml and of statistical significant with fatty pancreas, CIMT(0.02&0.0003) respectively. **Conclusion & Solution:** Treatment of the risk factors to prevent and delay the development and progress of NAFLD and its complications especially fatty pancreas that lead to DM .Also this will decrease CVS mortality and Morbidity

76

Creating Nearby Markets

Dr. Ghada Farouk Naiem Elsayed
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Abstract

The world population will increase by 23 percent by 2030, United Nations expects food and energy shortage. About a third of the world's food is lost each year. The food has validity period and should be carefully kept and quickly transported from supply to demand. However, transportation uses 25 percent of world energy. Therefor, we should minimize transportation and minimize time for food delivery. This paper proposes a technique to help solving this problem by creating nearby markets. A market is a channel between supply and demand in which a complete information about a product is described to enable activating a deal. This solution is valid upon three conditions: First, the supply must be close in distance to the demand, Second an IoT device is needed for both the seller and buyer hands, Third, Wi-Fi networks to works as channel, which is already widespread. Wi-Fi automatically switches between access points depending on the signal strength and therefore the distance proximity. This short distance channel guarantee minimizing both transportation and delivery time. Here the product is food and the IoT device is or example a smart phone for demand and a smart refrigerator for supplier. It is a refrigerator which has been programmed to sense what kinds of products are being stored inside it and keep a track of expiration date of the stock through bar-code or RFID scanning. Based on user configuration, it announces for the product on sale over the direct Wi-Fi channel between it and the buyer phone. Exchanging the product and paying the price is out of our scope. Network simulation is performed and the performance curve showed that this is zero cost market superimposed on existing networks and it returns the lost value of a very valuable resources: food and energy

Egypt's Nationally Determined Contributions to Paris Agreement: Review and Recommendations

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Abstract

During Paris Agreement, a historic climate landmark signed in Paris in 2015, leaders of about 200 countries committed to limiting global warming well below 2°C above pre-industrial levels, and pursuing efforts to limit it to 1.5 °C by 2100. Each Country defined its commitments as Nationally Determined Contributions (NDCs). Egypt, with only 0.6% contribution to total global emissions, is one of the most susceptible countries to the effects of climate change. Egypt submitted its NDCs in 2017 to be activated in 2020. Egypt's NDCs are too general and does not provide quantified targets nor plans for emission reductions. Moreover, Egypt's NDCs are conditional on receiving international funding of 73 Billion Dollars. This paper reviews Egypt's NDC in an effort to enhance and elevate it to its true level of importance and to correctly display Egypt's long-standing commitment to climate change efforts. It shows that a target of reducing CO_2 emissions by 20% from current 250 MtCO2eq by 2030 is possible. Actions include reshaping the energy mix for electricity generation from (91% oil & gas and 9% hydroelectric & renewables) to (67% oil & gas and 33% renewables, hydroelectric & nuclear energy). In transportation, fuel switching from oil to gas in 10% of the current 12 Million vehicles and promotion of electric vehicles to reach another 10%. Other actions including energy efficiency in industry by promoting the use of high efficient motors, variable speed drives and waste heat recovery, replacing inefficient lighting with LEDs in street lighting and residential sector and removing energy subsidies can balance the expected growth in energy demand. These actions can be done with local resources besides firmly applying environmental regulations. International funding is required for adaptation to the results of climate changes. The required technical and financial support for such adaptation needs extensive studies.

China's Balance of Payments Evolution from Deficit to Sustainability Surplus

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Abstract

China's experience has aroused much controversy in international societies, as it has become a guiding experience for many developing countries seeking economic growth and the treatment of external imbalances (deficits), and this experience has been known for their macroeconomic breakthroughs at all levels. In the beginning of the founding of the People's Republic of China in 1949 and the beginning of the communist regime, the main task of the Chinese was to restore and rehabilitate the country after the war, as well as the legacy of the past economic backwardness and population pressure, establishing the "New China". During the same period the international trade had been extremely limited, with economic relations restricted to the import and export of commodities in addition to the foreign trades, thus Chinese suffered from years to the external deficit. The policy of reform and the open door was adopted, until the deficit completely vanished in the mid-1990s and even turned into a surplus of current and financial balance and hence a surplus in the total balance. In this paper, the development of China's balance-of-payments components and transition stages will be analyzed using some statistical tools. The evolution of economic variables affecting external balance, that motivated China to reach the most important corrective measures to remedy the external deficit, as well as the basic pillars on which it depended to sustain the surplus in the balance of payments. The Egyptian economy is considered one of the most important indicators that reflect the Egyptian economy's external situations and the extent of its disorders resulting from both internal and external causes and drawing the most important lessons from China's experience to benefit from them in confronting and reducing Egypt's external deficit. A comparison will be conducted between the two countries with a discussion for the beneficial lessons that been implemented in the Egyptian context.

Exact Minimum Lower Bound Algorithm for Traveling Salesman Problem

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Abstract

The minimum-travel-cost algorithm is a dynamic programming algorithm to compute an exact and deterministic lower bound for the general case of the traveling salesman problem (TSP). The algorithm is presented with its mathematical proof and asymptotic analysis. It has a (n^2) complexity. A program is developed for the implementation of the algorithm and successfully tested among well known TSP problems.

Research on Inclusive Education in Egypt;
Can it be a factor in enhancing sustainable development?

Hadeel El-Ahraf

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Abstract

Egypt has made great strides in enacting laws pertaining to inclusive education as well as in economic reforms and development.Sustainability is dependent on continuity where the human factor is significant in building cohesive communities and where all members of the society can work well together.. So far, sufficient research in the area of inclusive education has not been equivalent .to the importance of this goal in support of sustainable development in Egypt. The author has been conducting a case study on how inclusive education has been implemented in a private international school in Egypt. Preliminary findings indicate that participants viewed inclusive education as a positive for **all** students as it helps them learn how to interact with diverse individuals and become productive members of their communities as adults. This understanding can help reduce social stigma around special needs at a societal level going forward. Participants raised concerns about limited financial, physical and human resources available to them and the negative impact this can have on the types of services they are able to provide to students with special educational needs. Overall, the results of the study were positive and showed how inclusive education can be implemented in the Egyptian private school sector.

A Cost-Effective Viable Strategy for Gradually Transitioning Egypt's Cities into Truly IoT-enabled Smart Cities

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Abstract

A smart city is a city that uses information and communication technologies (ICT), smart sensors, actuators and video cameras —connected via an intelligent network— to better support and optimize the delivery of urban services and to address challenges within city communities. A smart city collects and analyzes data from smart IoT sensors (IoT devices/nodes) and video cameras. The data collected by the sensor nodes can be used to develop applications and systems that benefit the city and the community.

Smart city industry is projected to be a $400 billion market by 2021, with 600 cities around the globe expected to generate 60% of the world's GDP by 2025, according to McKinsey research. Many cities have adopted at least one smart city project. However, the majority of cities around the globe are not yet smart cities. The key hurdle is securing the huge fund needed to start a smart city project, and ensuring that there are sufficient resources to sustain the project over time. This will lead to a huge digital divide between the cities that can afford building new smart city infrastructure, compared to cities that cannot afford such a large financial undertaking.

Because implementing new smart city infrastructure is a large and complex financial undertaking that poses a financial hurdle, specifically, for most of the under-developed countries, a viable and cost-effective strategy is needed to tackle this problem and conquer the digital divide. Building upon and leveraging existing infrastructure is the key to address this problem. This minimizes the cost of technology upgrades and allows for an easier integration process. In addition, leveraging existing infrastructure can give cities a better and quicker return on investment.

Existing public streetlights infrastructures are the most suitable current structures and technologies that can be upgraded to create a smart city. Specifically, smart LED lighting can provide cities a point of entry into achieving and creating broader smart cities infrastructures. A smart LED light has sensors embedded into it and connectivity to the cloud (Internet). While most smart city applications remain at the pilot level, there is a consensus among all stakeholders that smart street lighting is a critical first step to open up these opportunities.

82

The main objective of this work is to devise an innovative research and development initiative, which builds upon and leverages ongoing global deployment of smart city and outdoor lighting infrastructures trend, to explore the potential and assess the feasibility of gradually transitioning existing Egypt's cities infrastructure into truly IoT-enabled smart cities. Specifically, we propose and develop an innovative cost-effective, future-proof, scalable and modular end-to-end device-to-cloud connected outdoor Lighting network infrastructure solution that is based on P2P 4G LTE cellular technology to provide the direct connectivity between lighting poles (IoT devices) and the cloud. The proposed intelligent Lighting solution includes three key building blocks: 1) light pole-mounted smart control nodes; 2) cloud-based smart city software solution (NetServ) to remotely monitor, manage, and control the entire lighting infrastructure; and 3) P2P 4G LTE cellular network. In the proposed architecture, smart streetlights serve as the framework for a high- bandwidth, low-latency wireless sensor network, capable of transporting large amounts of data in real-time, while concurrently supporting deployment of a wide range of smart city services.

Smart Cities in the 21st Century

Dr. Mohamed Attalla
Executive Director, University of Illinois USA

Abstract

The term Smart Cities has been growing rapidly all over the world. Professional and experts has different definitions of how a Smart City would look like or what technologies would be incorporated into its affairs. Generally, we could safely state that Smart Cities utilizes Technology, Data Analytics and Big Data in order to optimize its operational efficiencies and enhance the lives of its residents. During their pursuit for the development of Smart Cities, officials usually focus on a wide and diversifies technologies and services. These technologies and Services would include the incorporation of Infrastructure Technology, environmental management including indoor environment, Transportation System and moving people.

Furthermore, Higher Education Institutions in North America have been working diligently to establish Smart Campuses. Campuses in North America are considered to be small towns. Officials work on establishing portals and platforms that connect available transportation, space utilization, locations of amenities, movement of people throughout the day, week and year, energy conservation, waste diversion, different interests, etc.

This presentation will illustrate the most recent applications and technologies that are utilised to form a Smart Campus. The potential application in new campuses in Egypt as well as the New Capital City will also be discussed.

Smart cites sustainable development

Eng. Mohamed El-Bostany
The head of the Real Estate Developers in New Cairo, Egypt

Abstract

As the majority of world population will be living in cities by 2050 which will have high impact on the standard of living and environment which must be addressed one of the most promising solutions is smart cities smart cities have the potential to make a significant contribution to urban sustainability, by using information and communication technology (ICT) to gather urban data and improve performance and management and help in identifying problems as they rise and dell with current problems and help in the fight against climate change

85

AEAS 46th, Annual International Conference – 2019

AEAS Profiles

Dr. Waguih ElMaraghy is a professor in the Department of Mechanical, Automotive, and Materials Engineering at the University of Windsor, and a founding Director of its Intelligent Manufacturing Systems Centre. He is a Professional Engineer in Ontario (PEng) and is a Fellow of: The Canadian Society for Mechanical Engineering (CSME), the American Society of Mechanical Engineers (ASME), the International Academy of Production Research (CIRP), the Canadian Academy of Engineering (CAE), Engineers Canada (FEC) and the Society of Manufacturing Engineers (SME). He has supervised more than 75 researchers and has over 300 publications and 3 patents.

Dr. Waguih ElMaraghy was recently honored, as Design Theory and Methodology Founder, by the American Society of Mechanical Engineers (ASME) at its International Design Engineering Technical Conferences & Computers and Information in Engineering (IDETC/CIE) Conference in Quebec City, August 26-29, 2018. Professor ElMaraghy also received a pin recognizing his 30 years of involvement with DTM. The first DTM conference that was held in Montreal, Quebec, Canada, September 17-21, 1989, sponsored by the Design Engineering Division, ASME that Dr. ElMaraghy co-chaired. It has made significant research contributions in engineering design and manufacturing both in academia and prior to this in industry as a chief design engineer. Dr. ElMaraghy has also been appointed, as member-at-large for 3 years starting in July 2019, to the Canadian Engineering Accreditation Board (CEAB). He is a registered professional engineer in Canada and Egypt where he continues to collaborate in major transformational projects of national importance.

Dr. Hoda ElMaraghy, PEng, a Distinguished University Professor in the Department of Mechanical, Automotive, and Materials Engineering at the University of Windsor, where she became the first woman Dean of Engineering in Canada. She is a founding director of its Intelligent Manufacturing Systems Centre and held Tier I Canada Research Chair in Manufacturing Systems for 14 years since 2002. She received an Honorary Doctorate from Chalmers University in Sweden and many other awards and recognitions for research, teaching and leadership. She supervised > 100 researchers and has > 500 publications.

Dr. Hoda ElMaraghy is recipient of the Order of Ontario for being "a trail-blazer, inspiration and mentor for aspiring young men and women engineers in Canada and beyond whose research helped influence public policy, positioning Canada at the forefront of emerging transformative technologies and global trends in manufacturing". She is a Fellow of the Royal Swedish Academy of Engineering Sciences (IVA), the Royal Society of Canada (RSC), the International Academy of Production Research (CIRP), the Canadian Academy of Engineering (CAE), Canadian Society of Mechanical Engineers (CSME), and Society of Manufacturing Engineers (SME). Dr. Hoda ElMaraghy has been hailed as a "world leader in manufacturing systems", by the Royal Society of Canada (RSC) in 2018, citing her pioneering research and publications naming her "pre-eminent scholar of manufacturing systems research in Canada and internationally. Her inspiring research opened up new research fields in Co-Evolution and Co-Development of Products and Manufacturing Systems using principles of Natural Evolution".

Dr. Aboelmagd Noureldin is a Professor at the Department of Electrical and Computer Engineering, Royal Military College of Canada (RMCC) with Cross-Appointment at both the School of Computing and the Department of Electrical and Computer Engineering, Queen's University. He is also the founder and the director of the Navigation and Instrumentation research group at RMCC. His research is related to global navigation satellite systems including GPS, wireless location and navigation, indoor positioning and multi-sensor fusion targeting applications related to autonomous systems, intelligent transportation, road information services, crowd management, and internet of things.

Dr. Noureldin holds B.Sc. degree in Electrical Engineering (1993) and M.Sc. degree in Engineering Physics (1997) both from Cairo University, Egypt. In addition, he holds Ph.D. degree in Electrical and Computer Engineering (2002) from The University of Calgary, Alberta, Canada. Dr. Noureldin is a Senior member of IEEE. He has published more than 250 papers in journals, magazines and conference proceedings. Dr. Noureldin's research work led to 13 patents and three technologies licensed to industry in the area of position, location and navigation systems.

Dr. Naser El-Sheimy, PEng, CRC

Professor and Canada Research Chair Fellow, Canadian Academy of Engineering Fellow, the US Institute of Navigation (ION) China 1000 Talent Foreign Expert Department of Geomatics Engineering, The University of Calgary Founder and President of Profound Positioning Inc. (PPI)

Dr. Naser El-Sheimy is Professor and former Head of the Department of Geomatics Engineering, the University of Calgary. He holds a Tier-I Canada Research Chair (CRC) in Geomatics Multi-sensor Systems. His research expertise includes Geomatics multi-sensor systems, GPS/INS integration, and mobile mapping systems. He is also the founder and president of Profound Positioning Inc.

Dr. El-Sheimy published two books, 6 book chapters and over 450 papers in academic journals, conference and workshop proceedings, in which he has received over 30 national and international paper awards. He supervised and graduated over 60 Masters and PhD students. He is the recipient of many national and international awards including the ASTech "Leadership in Alberta Technology" Award the Association of Professional Engineers, Geologists, and Geophysicists of Alberta (APEGGA) Educational Excellence Award. He also received the Schulich School of Engineering Research Excellence Award, the Schulich School of Engineering Teaching Excellence Award, The UofC Student Union Teaching Excellence Award, and 4 times the departmental teaching award, 2 times departmental research excellence award, and the department of Geomatics Engineering Graduate Educator Award.Dr. El-Sheimy was the president of Commission I on "Sensors and Platforms" of the International Society for Photogrammetry and Remote Sensing (ISPRS) from 2008 - 2012. He organized and participated in organizing many national and international conferences and chaired many conferences such as the USA Institute of Navigation Global Navigation Satellite Systems (GNSS). Dr. El-Sheimy is currently a member of the Editorial Board of Journal of Survey Review, MDPI Sensors, Journal of Applied Geodesy, and Coordinates.

Dr. Ahmed Shaker is a Professor at the Department of Civil Engineering, Ryerson University, Toronto, Canada. He is currently the Associate Chair of Undergraduate Studies of the Civil Engineering Department. Dr. received his B.Sc. and M.Sc. degrees from Cairo University in 1993 and 1998, respectively and his Ph.D. degree from the Department of Land Surveying and GeoInformatics, the Hong Kong Polytechnic University, Hong Kong in 2004. Dr. Shaker has international work experience in Canada, Spain, Hong Kong, Egypt, and Kuwait. His research interests cover the fields of LiDAR data processing, satellite sensor modelling, image segmentation and classification, and 3-D modeling. Dr. Shaker has 2 patents and more than 120 publications in international journals an conferences.

Dr. Shaker is the recipient of the National Science Progress Award in Surveying and Mapping from the Chinese National Congress in 2005; Marie Curie Incoming International Fellowship from European Commission in 2006; Faculty Scholarly, Research and Creative Activity Award from Ryerson University in 2011; the Bronze Medal Award from the Canadian Remote Sensing Society in 2011; and Dean's Teaching Award in 2015. Dr. Shaker's students have received more than 28 different national and international awards in the last 7 years. Dr. Shaker is an active member of several scientific national and international organizations. He is serving Executive member (Director) and Vice-President of the Canadian Remote Sensing Society (CRSS). Dr. Shaker is currently the Vice-President of the International Society of Photogrammetry and Remote Sensing (ISPRS) Commission III (Remote sensing) - 2016-2020.

Dr. Tarek Saadawi has been with the City University of New York, City College, since 1980, where he currently directs the Center of Information Networking and Telecommunications (CINT) at CCNY. He's also the co-Director and co-Founder of the Master Degree Program in Cyber Security starting in Fall 2020. His current areas of research are cyber security, intrusion detection systems with applications to smart grid and autonomous systems, and blockchain. Dr. Saadawi is a Former Chairman of IEEE Computer Society of New York City. He has received IEEE Region 1 Award.

He is a Lead-author of a book on telecommunications. He is also the lead author of Egypt Telecommunications Infrastructure Master Plan, funded by USAID. He has been invited and joined US Department of Commerce delegation trip to the Government of Algeria addressing rural communications.

Professor Adel S. Elmaghraby is the Director of Industrial Research and Innovation and Chair of the Computer Engineering and Computer Science Department at the Speed School of Engineering - University of Louisville. He has also held appointments at the Software Engineering Institute - Carnegie-Mellon University, and the University of Wisconsin-Madison. He advised over 60 master's graduates and 25 doctoral graduates.

His research contributions and consulting spans the areas of Intelligent Multimedia Systems, Neural Networks, PDCS, Visualization, and Simulation. His research applications include Smart Cities, Data Analytics, Medical Imaging, Bioinformatics, and Computer-Aided Diagnostics. He is a well-published author, a public speaker, member of editorial boards, and technical reviewer. He was recognized for his achievements by several professional organizations including a Golden Core Membership Award by the IEEE Computer Society at the 50th anniversary celebration. Dr. Elmaghraby continued collaborations, mentoring, and scientific contributions have resulted in research funding, international collaboration, and published articles in many prestigious journals such as IEEE-TMI, Medical Physics, Journal of Neuroscience Methods, and Protein Engineering. He has also been an active member of the IEEE-CS Technical Activities Board and chair of the emerging technologies initiatives.

Dr. Hossam A. Kishawy, is Professor and Associate Dean University of Ontario Institute of Technology Oshawa, Ontario, CANADA L1H 7K4 Dr. Kishawy is a Professor and Associate Dean in the Faculty of Engineering and Applied Science at University of Ontario Institute of Technology, Canada.

His research interests cover several aspects of modelling manufacturing processes, optimization, design and stress analysis. His recent book entitled "Machining Difficult-to-Cut Materials: Basic Principles and Challenges" (a recently published by Springer) presents the state of the art research related to machining of difficult to cut materials and his findings in the area of machining mechanics and surface quality and integrity. Together with his research group he has over 200 publications in reputable journals, conferences and book chapters. He is a senior member of the SME, Fellow of the ASME, CSME and EIC and a member of the association of Ontario Professional Engineers.

92

Dr. Elsayed Elbeshbishy is an assistant professor at Ryerson University and the Vice President of Canadian Association on Water Quality (CAWQ) for Central Region in Canada.

Dr. Elbeshbishy is collaborating with different industries and municipalities for developing new technologies for value-added products recovery from wastes. He investigated different pretreatment technologies for enhancement of biohydrogen and biomethane production from municipal solid wastes. He introduced ultrasonication, for the first time, as a novel pretreatment method for enhancing biohydrogen production from solid waste as opposed to the common application of ultrasonication prior to anaerobic digestion to enhance methane formation. He has more than 50 peer reviewed journal article, 80 conference proceeding, and three book chapters with h-index of 23. Dr. Elbeshbishy focuses in developing new solid pre-treatment technologies to enhance the anaerobic digestion process.

Dr. Mohamed Gamal El-Din is a Professor in the Department of Civil and Environmental Engineering at the University of Alberta. His research focuses on the fundamentals of advanced and innovative treatment approaches for water and wastewater (municipal and industrial such as oil and gas). Since 2011, he holds an NSERC Senior Industrial Research Chair (IRC) in Oil Sands Tailings Water Treatment. Because of his contributions in the area of oil sands process water treatment/reclamation,

In 2017, Dr. Gamal El-Din received the Alberta Science and Technology Leadership (ASTech) Foundation Award for Innovation in Oil Sands Research. His research work has resulted in important advancements in the area of advanced oxidation and ozone treatment, membrane separation and biological processes. Another part of his research program has centered on the development of new materials and their applications in water and wastewater treatment. Dr. Gamal El-Din's research program also focuses on the development of cost-effective and simple, yet highly efficient treatment systems for rural communities in both industrialized and developing countries. Dr. Gamal El-Din's research has resulted in more than 216 refereed journal papers and 333 conference and workshop presentations. Currently, Dr. Gamal El-Din's h-index is 48 (7683 citations) as per Google Scholar.

Dr. Mohamed Attalla, obtained both a Masters and a Ph.D. in Engineering Management from the University of Waterloo in Canada as well as an Executive Master of Business Administration from McMaster University in Canada. As the current Executive Director at the University of Illinois, Dr. Attalla is part of the Chancellor's Cabinet at one of the top ten public universities in the USA. Dr. Attalla is a major player in forming the university policies in support of its strategic mission. Dr. Attalla is leading a team of over 1,100 people and a budget of over $800 Million annually and collaborates in multidisciplinary research projects. Dr. Attalla also served as Associate Vice President at McMaster University in Canada. As part of the President's Senior team, Dr Attalla has played a significant role in shaping the university's policies to advance its Education programs and to maintain its position as a global university that is ranked 4th in Canada. .

Dr. Attalla's diversified experiences include all aspects of Management and Leadership, Strategic Planning, Organizational efficiencies in addition to Energy Conservation, Engineering Sustainability and Infrastructure Management. Dr. Attalla published/presented over sixty papers in international journals and refereed conferences in Sustainable Construction, Renewable Energy, Infrastructure Management as well as Education and Research Management. Dr. Attalla plays a leadership role in the Association of Canadian University Business Officers and the Education Advisory Board in Washington where he presented annually on the new trends in Education advancements in North America.

Dr. Attalla received several awards such as the Annual Engineering Medal in Management and Leadership from the Engineering Association in Canada, The Walter Shanely Award from the Canadian Society for Civil Engineering (CSCE), inducted as a Fellow of CSCE, and recipient of the Award of Excellence from the Minister of Infrastructure Renewal in Canada. He served as Conference Chair, Secretary General, Vice President and President of the Association of Egyptian American Scholars (AEAS). Dr. Attalla has contributed significantly to Higher Education where he made several annual presentations at the AEAS conferences, supported the Higher Education Enhancement Program Fund (HEEPF), delivered workshops for Faculty Leadership Development Program, the National Authority for Quality and Accreditation in Education, delivered several training for Strategic Planning in Higher Education, led several discussions for ranking of Higher Education institutions in Egypt, etc. Dr. Attalla served as a professor with the Master's degree for Healthcare professionals with the Faculty of Medicine, Suez Canal University and Maastricht University Netherlands.

Dr. Moatassem Abdallah is an Assistant Professor in the Civil Engineering Department at University of Colorado Denver. He holds a Ph.D. from University of Illinois at Urbana-Champaign in 2014. Dr. Abdallah published more than 50 peer reviewed articles, presented his work in national and international conferences, and received more than $1,000,000 to support his ongoing and past research work.

Dr. Abdallah's research work focuses on presenting practical solutions in a number of important areas within the discipline of construction engineering and management, including (1) generating optimal plans for delivering construction projects to minimize construction cost and time while maximizing quality and sustainability; (2) upgrading existing buildings to maximize their sustainability, (3) identifying optimal plans for business commuting systems to minimize their emissions, time, and cost; (4) studying worker safety based on various environmental work conditions, and (5) measuring thermal comfort of building occupants using wearable devices, (6) using building information modeling in planning of construction projects.

Dr. Hesham El-Askary, Ph.D.
Prof. of Remote Sensing and Earth Systems Science, Director Computational & Data Sciences Graduate Programs Center of Excellence in Earth Systems Modeling & Observations Schmid College of Science and Technology, Chapman University, USA Prof. El-Askary received his Ph.D. in Computational Sciences and Informatics from George Mason University in 2004 along with his two MS degrees in Computational sciences and Earth Systems Sciences. He is also a Professor of Environmental Physics on leave with the Department of Environmental Sciences, Faculty of Science, Alexandria University, Egypt. Prof. El-Askary was also affiliated with the National Authority of Remote Sensing and Space Sciences (NARSS), Cairo.

Dr. El-Askary has been also elected on national basis to be a member of 30 in the Ministry of Justice consultant team for Environmental affairs since 2008 until now. He is the 2015 recipient of the Chapman University's elite Senior Wang-Fradkin Professorship award. He was named as one of six 'Game Changers: Orange County Leaders Transforming the World' by the Orange County Business Council. Prof. El-Askary also served as the regional coordinator on a $3 million Euro grant from the European Union's (EU) Horizon 2020 that started February 2016. The three year project, known as GEO-CRADLE, which stands for Coordinating and integrating state-of-the-art Earth Observation Activities in the regions of North Africa, Middle East and Balkans and Developing Links with GEO related initiatives toward GEOSS.

95

Dr. Khaled Sennah is a Professor of Structural Engineering and Chair of the Civil Engineering Department at Ryerson University, Toronto, Canada. He obtained his B.Sc. and M.Sc. degrees in civil engineering from Alexandria University of Egypt in 1985 and 1990, respectively, and his Ph.D. in structural engineering from University of Windsor in 1998.

Dr. Sennah, core area of expertise includes design, evaluation and rehabilitation of bridges on which he has more than 260 publications and supervised over 75 graduate students. He has demonstrated numerous evidences of impact and contribution to economical design and sustainable construction that led to field applications and standards. In collaboration with Ontario Ministry of Transportation (MTO) and industry partners in USA, Canada and Germany, his research team conducted innovative research including (i) the development of prefabricated bridge elements and connection technologies to accelerate bridge construction, (ii) development of crashworthy and cost-effective, bridge barrier and deck slabs reinforced with glass fibre reinforced polymer (GFRP) bars for sustainable construction and (iii) cost-effective and accelerated FRP repair strategy to bridge girders damaged by vehicle impact. Dr. Sennah's research achievements have been recognized by international awards such as the 1999 Arthur Wellington Prize for best journal paper in transportation-related infrastructure and the 2002 State-of-the-Art in Civil Engineering award, both from the American Society for Civil Engineers. Also, he received the 1998 P.L. Pratley Award for best journal paper in bridge engineering and the 2013 A.B. Sanderson Award from the Canadian Society for Civil Engineering for "*Outstanding Contributions by a Civil Engineer to the Development and Practice of Structural Engineering in Canada.*" In recognition of his long-term achievements, he was elected Fellow of the Canadian Society for Civil Engineering (CSCE) in 2011, Fellow of the Engineering Institute of Canada (EIC) in 2016, and Fellow of the Canadian Academy of Engineering (CAE) in 2017. He is currently an Associate Editor for the Canadian Journal for Civil Engineering. Also, he is a member of three Canadian Standard Association's Technical Committees for the development of the Highway Bridge Design Code.

Dr. Mohamed Elhabiby

is goal-driven business professional with strong R&D industrial experience, continually recognized for impressive contributions to strategy definition and execution, process improvements, and special assignments in terms of jump-starting new businesses and building best-in-class organizations, shaping a culture that emphasizes health, safety, and family first so that employees feel appreciated and supported. Dr. Elhabiby is the Co-founder and Executive Vice President of Micro Engineering Tech Inc and President of RoboGarden Inc., located at Calgary, Alberta. He received both his PhD in Geomatics Engineering in 2006 and Executive MBA with finance major in 2017 from the University of Calgary

He won the Alberta Science and Technology Foundation (ASTech) Award in Applied technology 2015. He is named by Avenue Magazine as one of Top 40 under 40 2013 class. He was the Chair of WG 4.1.4: Imaging Techniques, Sub-Commission 4.1 at the International Association of Geodesy. He chaired the Geocomputations and Cyber-infrastructure session at the Canadian Geophysical Union annual meeting for five consecutive years (2008 – 2012). He was the Treasure of the Geodesy Section at the Canadian Geophysical Union for six years (2008-2014) and he was a leader of an Archaeological mission at the Area of Great Pyramids, Cairo, Egypt. He published more than 120 academic journals, conference presentations, book Chapters, workshop proceedings and technical reports. He supervised several PhD, MSc. Students and Post Doctorate Fellows at both Academia and Industry

Dr. Abdel-fattah S. Yousif

Dr. Yousif is the director of Advanced Research Computing (ARC) at the University of Calgary, Canada. He works with over 700 researchers in all areas of research that require computational science. His team provides High Performance Computing (HPC) infrastructure and research workflow design and deployment of computational research. His team provides expert knowledge in Machine Learning (ML) and AI for customized Medicine and Engineering research.

Prior to joining the University of Calgary as the director of ARC, Dr. Yousif spent 10 years in the telecommunication sector in Information Technology (IT), Network Engineering and network Big Data Analytics. He led a team of Engineers and software developers in building and operating Big Data Analytics platform to support real-time data analytics using predictive algorithms. He was also focused on using ML techniques to predict customers churn and develop market development insights to increase corporate revenues.

Dr. Yousif joined the University of Calgary as a research associate and a lecturer between 2004 and 2008. He developed the Time-Based Analysis group in the Elect. & Comp. Eng. Department. During his tenure, he published three journal papers and five conference papers as well as one patent.

After attaining his PhD in 1995, Dr. Yousif joined Intel Corporation's next generation CPU design team in Portland, Oregon USA. In his first five years with Intel, Dr. Yousif was a senior design Engineer on the Pentium4™ Microprocessor project. He was responsible for the Deign-for-Test architecture and implementation in the Pentium4™. After completing the Pentium4™ project, Dr. Yousif led a team of designers to deliver low power design techniques for the Mobile CPU line of products. After eight years with Intel, Dr. Yousif decided to go back to research and to join the University of Calgary where he obtained his PhD.

98

Dr. Khaled El-Rayes is a Professor and an O'Neil Faculty Scholar in the Department of Civil and Environmental Engineering at the University of Illinois at Urbana-Champaign. El-Rayes has more than 30 years of professional experience in both academia and the construction industry. He taught numerous graduate and undergraduate courses in the area of construction engineering and management and he was repeatedly named to the "List of Teachers Ranked as Excellent by their Students" at the University of Illinois. He also served as PI and Co-PI on numerous research projects with budgets totaling more than $9Million that were funded by the National Science Foundation, Illinois Center for Transportation, and National Center for Supercomputing Applications.

The outcome of his research projects was published in more than 150 articles including more than 80 journal papers. The contributions of his research have also been recognized nationally and internationally, receiving many research awards including the "*Best Conference Paper Award*" from the ASCE Construction Research Congress in 2012, the "*Best Journal Paper Award*" in 2010 from the ASCE Journal of Construction Engineering and Management, the "*ASCE Thomas Fitch Rowland Prize*" in 2007; the "*NSF CAREER Award*" from the National Science Foundation in 2003; and the "*Doctoral Prize of the Faculty of Engineering and Computer Science*" from Concordia University in Canada in 1999. El-Rayes supervised the research work of 28 Ph.D. students, including 18 former Ph.D. students who are currently holding faculty Positions in Purdue University, Columbia University, University of Colorado, US Air Force Institute of Technology, Florida International University, University of Santa Clara, University of Alexandria, and Kuwait University. El-Rayes served as the Secretary, Vice-Chair and Chair of the ASCE Construction Research Council, which is widely recognized as the premier national forum for Construction Engineering and Management research and it includes in its membership more than 200 professors and scholars.

Dr. Ahmed ElSawy joined Tennessee Technological University (TTU) as a Professor and Chairperson, Department of Manufacturing and Engineering Technology in July 1999. Prior joining TTU, he was a professor and graduate program coordinator in the Department of Industrial Technology at the University of Northern Iowa. Before that, Dr. Elsawy founded a Manufacturing Engineering Department at St. Cloud State University in Minnesota. He served as a full professor at the Department of Mechanical Design and Production in Cairo University till 2006.

Dr. ElSawy teaching and research interests are in the areas of material processing, metallurgy and manufacturing systems. Dr. ElSawy received ~ $2M of state, federal, and industrial grants in support of his laboratory development and research activities. He advised several masters and doctoral students who are holding academic and industrial positions in the USA, Germany and Taiwan. Dr. ElSawy has numerous publications in national and international conferences and refereed journals.

Since joining the Association of Egyptian American Scholars, Dr. Elsawy actively participated in almost all events organized by the association including presenting research papers in all the conferences held in Egypt. Dr. Elsawy organized an ABET Accreditation Workshop in the faculty of Engineering AinShams University, and visited Tanta university, Suez Canal University, Alexandria University, ElMansura university as well as facilitated two graduate students from the faculty of Engineering to finish their PhDs in Electrical Engineering from Tennessee Tech University. He attended also the quality of engineering education meeting organized by the Egyptian Embassy in Washington DC, and participated in the strategic planning for the Egyptian Council for Higher Education. Last year, Dr. Elsawy started to establish a collaboration with the Central Metallurgical Research for the production of gray cast iron and bearings.

Dr. Ahmed Ali A. Mohamed (El-Tallawy) is an Associate Professor of Electrical Engineering (EE) at the City College of the City University of New York (CUNY). He is the Advisor of the EE PhD Program, and the founding director of the CUNY Smart Grid Interdependencies Laboratory (http://smartgrid.ccny.cuny.edu). He received his PhD degree from Florida International University in 2013.

His research interests include Smart Grids, Critical Infrastructure Interdependencies, Food-Energy-Water Nexus, Renewable Energy Systems, and Transportation Electrification. He has numerous publications in these fields as book chapters and articles in premier journals and conference proceedings. He has led, and is currently leading, several major research projects funded by various companies and national funding agencies, such as the US National Science Foundation and Con Edison (the utility distribution company of New York City). He has been working closely with several city and state agencies (e.g., New York City Transit, New York City Mayor's Office of Sustainability, and New York State Energy Research and Development Authority) to achieve New York State's 2050 sustainability and GHG reduction goals. He has also served as a consultant for multiple renewable energy and energy storage companies.

Dr. Mohamed received several awards, including the prestigious NSF Early Career Development Award (CAREER), the CUNY Provost's Award for Pedagogical Innovation, and the IEEE/PES Miami Section Outstanding Young Engineer Award. In addition, several of his papers received best-paper awards. He has served as a reviewer, invited editor, topic chair and session chair at various top-tier journals and international conferences. He has served on review panels for several national and international funding agencies, e.g. the US National Science Foundation and the Chilean National Science and Technology Commission. He is a Senior Member of the IEEE, and has held several IEEE executive positions.

Dr. Mohamed A. ALI

Dr. Ali received the NSF Faculty Early Career Development Award. This is the most prestigious academic award and honor a faculty can ever achieve during the early stages of his career. He has acted as a frequent reviewer for several IEEE journals and NSF, chaired/committee member of technical sessions in several international telecom conferences, the IEEE GLOBECOMM'02 and ICC'02. Dr. Ali has consulted for several major carriers in the US including Verizon and AT&T.

Dr. Ali received his MS and Ph. D., all in Electrical engineering from the City University of New York in 1985 and 1988, respectively.

has more than 30 years experience in IT and telecommunications research. He is the author and co-author of more than 200 refereed journal papers, invited talks, book chapters, and conference presentations. His research synthesizes and extends results over the full discipline of mobile/fixed networking technology and architecture, from the physical layer of devices and components to the architecture layer of local access, Metro, and global carriers. His most recent work focuses on smart grid technologies and applications including Microgrids, plug-in electric vehicle (PEV)-to-grid (V2G) systems, and distributed energy resources as well as the interdependencies between the ICT and power grid networks. Much of his work has centered on interworking between network elements and interaction among different protocols; his expertise in NC&M includes the entire stack, from Layer 1 to the highest layers including the newest generation of Software Defined Networking (SDN), Network Function Virtualization (NFV) and Cloud/Edge-based computing technologies. He has extensive track record in IP/MPLS-based Layer 1/2/3 Enterprise MAN and VPNs, Optical Networking Technology& Architecture, Next Generation data-centric wired/ wireless Networking Architecture, Fifth-Generation (5G) cellular networking architecture and technologies including LTE-A-enabled Heterogeneous networks (HetNets) and machine-to machine (M2M) and machine-type communications (MTC), 4G mobile WiMAX and Cellular Long-Term Evolution (LTE) systems, Mobile core (EPC) technolgy and architecture, Single-channel TDM-based Passive Optical Network (TDM-PON)-based Fiber-To-The-Home (FTTH) access solutions including broadband PON (BPON), gigabit PON (GPON), and Ethernet PON (EPON), multichannel C/WDM-PONs, data and voice (traditional as well as converged Voice over Packet solutions) networks and fiber optic communication systems, fast packet and Ethernet switching, IP/MPLS/GMPLS-based routing and signaling protocols, Traffic Engineering, Carrier-Grade Ethernet networking technology, services, and architecture, Long-haul WDM and TDM/ SONET-based optical transport networks.

Dr. Ehab Kamarah is a Professional Engineer in Ontario and received his Master and PhD in Construction Engineering and Management from University of Waterloo, Canada. thinking, strong organizational and planning abilities, with excellent analytical and problem-solving skills. Dr. Kamarah led the construction project teams of architects, engineers, and construction professionals to deliver significant capital and renewal projects for major organizations in Canada such as Toronto District School Board, McMaster University and York University in excess of $600M.

Dr. Kamarah has extensive experience in managing major capital and renewal projects in complex and challenging secondary and post secondary sector, with proven record of successfully completing large and complex projects with tight schedules, on time and on budget to the satisfaction of all stakeholders. He effectively manages stakeholders' expectations, builds and motivates teams, and establishes efficient policies and processes to ensure project delivery success. He has excellent knowledge of current standards, techniques and tools in planning, budgeting, scheduling, tendering, and contract administration. Throughout his career, he has demonstrated strong leadership skills, independent

Dr. Kamarah conducted research and published multiple papers in international journals and conferences in the area of modeling and optimizing schedule, control and cost for repetitive projects such as high-rise projects and scattered infrastructural renewal projects. Dr. Kamarah research interest also includes enhancing the current project delivery methods to advance the efficiency with which modern sophisticated construction projects are delivered successfully. He also participated as peer reviewer for publications in different technical magazines and specialty conferences.

Dr. Amer El-Ahraf

A Former President of the Association of Egyptian American Scholars (AEAS) , and the (US) National Environmental Health Association (NEHA), Dr. Amer El-Ahraf is a Professor of Health Sciences and Vice President Emeritus, California State University, Dominguez Hills. He is President Emeritus of the American-European University Consortium.. A recipient of the "Snyder Award" (US) for Excellence in Environmental Health, he was Named by the Journal of Environmental Health as "One of the 15 Leaders of Environmental Health". Recognized for his services to Egypt, he is the recipient of awards from the AEAS and the Egyptian American Organization (EAO) including its highest i.e. "The Life Achievement Award". Former President of the "Giza-Los Angeles" Sister City Program, he was recognized by the Los Angeles County Board of Supervisors for "Promoting a Better Understanding between the Egyptian and American Cultures".

He is listed in WHOs WHO in AMERICA and WHO's WHO AMONG ARAB AMERICANS. He served as Professor, Department Chair, Vice President and President with expertise in university management and public health. He established innovative programs in Egypt such as the Department of Environmental Sciences, Faculty of Engineering, Zagazig University.. He supervised Egyptian PhD students; and, consulted with the Suez Canal University.. His research on Aflatoxin, a liver carcinogen exasperated by infectious hepatitis, has potential value to Egypt. Dr El-Ahraf is a graduate of the Faculty of Veterinary Medicine, Cairo University, the University of California, Los Angeles (UCLA) where he obtained his Doctorate with "Distinction"; and, Harvard University's Management Development Program..   A scientist with numerous publications, among which is the text book "Impact of Public Policy on Environmental Quality and Health"; and, a poet with a Diwaan/volume entitled "From the Home Land to the Diaspora:: A journey from Egypt to America ,with Love", he was recognized by the Orange Coast Voice , as the " Renaissance Man of Huntington Beach", (California)"

Abdel A. Abdel-Rahman, PhD, FAHA
Distinguished Professor and Vice Chair, is a Professor of International Business and Economics and served formerly as Dean of Graduate Studies at Wilkes University. I received my M.A./Ph.D. in Economics from Brown University/Clark University in the USA. I have published several papers and have lectured to various professional and civic organizations in the U.S. and abroad.

He has served on many departmental, school and university committees. He serves on the editorial boards of many journals, a member of over 10 professional societies (named Fellow of the American Heart Association, FAHA) and has served on many review panels including the NIH and American Heart Association.

Dr. Abdel-Rahman has been continuously funded by the NIH since 1988 through 2023 (2 overlapping R01 grants totaling 40 years of funding, >12 million dollars). He earned his Pharmacy and master's degrees at the University of Alexandria, Egypt, and his Ph.D in Pharmacology at Leeds University, England. He has conducted diverse research in the areas of neural control of circulation, estrogen modulation of cardiac function in health and disease, diabetes and cannabinoids. These research projects resulted in 150 scientific publications and have resulted in the training of 16 graduate students and 17 postdoctoral scholars

Dr. Wagiha A. Taylor, is a Professor of International Business and Economics and served formerly as Dean of Graduate Studies at Wilkes University. I received my M.A./Ph.D. in Economics from Brown University/Clark University in the USA. I have published several papers and have lectured to various professional and civic organizations in the U.S. and abroad.

I have acted as a consultant for the United Nations, as well as the president of Congress of Political Economists (COPE International), Pennsylvania Economic Association (PEA), Wilkes University Faculty Association, AEAS, and Northeast Pennsylvania Association of Arab-Americans. Other professional positions include the Chair of the Board of Directors of the Middle East Development and Science Institute in Washington D.C. (MEDSI). I am a Founding Life Member of both Eastern Economic Association and COPE International. I have traveled on business to Europe, the Middle East, the Far East, South America, and Australia. I am married with three children. I am currently a board member and Honorary President of COPE, International. I take students abroad yearly for an International/Global business Experience.

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