



**Electrical Engineering Department  
Collage of Engineering  
King Saud University  
Riyadh, KSA**

**Seminars held in 2011 and 2012**



Electrical Engineering Department,  
College of Engineering,  
King Saud University,  
Riyadh, KSA.



Invites you all to attend a Technical Lecture on

**"Reinforcement Learning Applications for Solving Multi stage  
Decision Making Problems"**

Tuesday, November 20, 2012 (6/1/1434H)

Time: 11:00 -- 12:00

Venue: Room 2C114, EE Department Meeting Room

**Abstract :**

Reinforcement Learning (RL) is one of the active research areas in machine learning and artificial intelligence. RL techniques have been used to solve various practical decision making and optimization problems. In particular it can be used to solve Multi stage Decision Making Problem (MDMP) under uncertainty. This lecture will explain use of RL for solving decision making problems considering examples from power systems area. Lecture outline is as follows:

- Modeling of a shortest path problem (SPP) as a MDMP
- Definition of state, state space, action, action space, transition function and the reinforcement function in the context of RL
- Choice of RL design variables for SPP
- Modeling of Unit Commitment Problem (UCP) as a MDMP
- Choice of RL design variables for UCP
- Application of RL to other engineering problems

**Note: All are welcome and refreshments will be served.**

**Speaker:**

**Dr. Imthias Ahamed**  
**Assistant Professor**

Dr. T.P. Imthias Ahamed received B.Tech degree in Electrical Engineering from Kerala University and M. Tech degree in instrumentation and control from NIT-Calicut, India. He obtained PhD from Indian Institute of Science, Bangalore, India in 2002. He is now an Assistant Professor with the Saudi Aramco Chair in Electrical Power, Electrical Engineering Department, College of Engineering, King Saud University, Riyadh. His current research interests include reinforcement learning, demand response, distributed generation, neural networks and power system scheduling.

كرسي أرامكو السعودية للطاقة الكهربائية  
Saudi Aramco Chair in Electrical Power



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## **“Carbon Nanotube Based Electronics – Future Perspective”**

Wednesday, May 23, 2012 (02/07/1433H)

Time: 11:00 am -- 12:00 pm

Venue: Room 2C114, EE Department Meeting Room

**All are welcome**

### **Abstract :**

The talk on Carbon Nanotube Based Electronics starts with the challenges associated with Nano-CMOS. It then presents the different technological options available which might augment or replace CMOS. It also highlights the different domains in which the research is directed at the moment in the Nanoelectronics area. The talk will conclude by our research group work on Carbon Nanotube based transistors and interconnects which has a lot of potential to replace CMOS and Cu interconnects.

**Speaker: Dr. Mohammad Hasan**  
**Professor, Electronics Engineering Department**  
**Aligarh Muslim University, Aligarh, India**

Prof. Mohammad Hasan has been working as a Full Professor for the past seven years in the Department of Electronics Engineering, Aligarh Muslim University, Aligarh in India. He also worked as a Visiting Researcher in the University of Edinburgh, UK on a prestigious Royal Academy of Engineering funded project on “Low power techniques and architectures for FPGA” in 2008-2009. He completed his PhD on “Low power architectures for multi-carrier receivers” from the University of Edinburgh, UK in 2003. He has published 121 research papers in refereed Journals and Conferences. One of his paper on “Low power FFT Cores” has been awarded “Paper of the year award” by the Editors of the ISI indexed “ETRI Journal” in 2006. Moreover, his paper on “Subthreshold DTMOS based adder” won the best paper award in an Internal Conference (ICSCI-2008) in India. He has supervised three PhDs and currently supervising three more in diverse areas of “Beyond CMOS Devices”, “Spintronics” and “Asynchronous Ultra Low Power Design”



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## **“Electromagnetic Compatibility: The Science of End Product”**

Tuesday, May 22, 2012 (01/07/1433H)

Time: 11:00 am -- 12:00 pm

Venue: Room 2C114, EE Department Meeting Room

### **Abstract :**

Electromagnetic compatibility (EMC) is the ability of an electrical or electronic system to function properly in its intended electromagnetic environment and at the same time not is a source of electromagnetic pollution to that environment. The electromagnetic environment is mainly composed of both radiated and conducted energy. Meeting the technical standards contained in the regulations of EMC is an obligation of the manufacturer or importer of a product. To guarantee compliance, the manufacturer must test the product according to the specific standards before the product can be marketed. The motivation in this lecture to present briefly what is meant by EMC, what are the main standards of EMC, what are the main measurement techniques and equipments to determine the compatibility of an electronic system and what are the main points that should be taken into consideration in order to design an electromagnetic compatible system.

**Note: All are welcome and refreshments will be served.**

### **Speaker:**

**Dr. Ahmed M. Attiya**

**Assistant Professor, Electrical Engineering Department, KSU**



**Dr. Ahmed M. Attiya** is an Assistant Prof. in Electrical Engineering Dept, College of Engineering, King Saud University. Dr. Attiya obtained M.Sc. and Ph.D. in electronics and electrical communication from Cairo University, Faculty of Engineering in 1996 and 2001, respectively. He was a Research Fellow in Virginia Poly Technique Institute and State University from Oct. 2002 to Dec. 2003. He was also a visiting scholar in University of Mississippi from Aug. 2004 to July 2005. Dr. Attiya is a Full Professor in Electronics Research Institute (Microwave Engineering Dept.), Egypt. He is a member of IEEE. His main research interests include electromagnetic wave problems, antennas, microwave

passive circuits and systems, numerical techniques in electromagnetic and electrodynamics problems.



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## **“Smart Grid: Getting into the Zone”**

Tuesday, May 1, 2012 (11/06/1433H)

Time: 11:00 am -- 12:00 pm

Venue: Room 2C114, EE Department Meeting Room

### **Abstract :**

Pressure to curb carbon dioxide emissions is leading to expanded adoption of renewable energy resources such as solar and wind energies, electric energy storage, and distributed energy resources (DER) as well as expanded electric transportation and demand response technologies. With high confidence and expectations, Smart Grid is envisioned to provide the enabling infrastructure for these carbon reduction technologies. Many expect that Smart Grid technologies will also bring added value through time-based dynamic pricing of electricity, demand response, and other market innovations and services. Global Smart Grid initiatives provide a great opportunity to recover the economic downturn by creating new jobs, and most importantly lead the nations in developing and deploying new innovative technologies and products to export. This is a defining moment in terms of Saudi Arabia's commitment to providing a modern and sustainable electric energy system, meeting societal needs of the 21st century and beyond. There is surely a critical need for research, development and demonstration of Smart Grid solutions. This presentation introduces the concept of Smart Grid, initiatives, and its main pillars. An attention will be given to the main topics of research and development of Smart Grid.

**Note: All are welcome and refreshments will be served.**

### **Speaker:**

**Dr. Essam A. Al-Ammar**

**Associate Professor, Electrical Engineering  
Department, KSU**



**Essam A. Al-Ammar** was born in Riyadh, Saudi Arabia. He received his BS degree (honor) in Electrical Engineering from King Saud University in 1997. From 1997-1999, he worked as a Power/software engineer at Lucent Technologies in Riyadh. In 2003, he received his MS degree from University of Alabama, Tuscaloosa, AL, and Ph.D. degree from Arizona State University in 2007. He is now an Associate Professor in Electrical Engineering Department, King Saud University, Riyadh, Saudi Arabia. Since Nov. 2008, he has appointed as advisor at Ministry of Water and Electricity (MOWE), and become as Chair Coordinator of Saudi Aramco Chair in Electrical Power. He worked as Energy Consultant at Riyadh Techno Valley (RTV), between Oct. 2009 and Oct. 2011. His current research and academic interests include high voltage engineering, power system transmission and distribution. Solar and wind energies are part of his research interest too. He is a member of IEEE since 2007 and Saudi Engineering Committee since 1997.



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## **“The Future of Cognitive Radios”**

Tuesday, March 13, 2012 (20/3 /1433H)

Time: 11:00 am -- 12:00 pm

Venue: Room 2C114, EE Department Meeting Room

### **Abstract :**

In this talk, I will discuss the current regulatory issues for opportunistic transmission, and the future networks based on these concepts. I will argue that the current regulations are conservative. Then I will present an overview of the limits of spectrum sharing/cognitive radio transmission systems, and discuss that they may be hard to achieve in some scenarios. Finally, I will speculate (based on these facts) about the future of cognitive Radio networks.

**Note: All are welcome and refreshments will be served.**

### **Speaker:**

**Dr. Vahid Tarokh**

**Professor, Electrical Engineering Department**

**Harvard University, USA**

**Vahid Tarokh** received the Ph.D. in electrical engineering from the University of Waterloo, Ontario, Canada in 1995. He then worked at AT&T Labs-Research and AT&T wireless services until August 2000 as "Member, Principal Member of Technical Staff, and finally as the Head of the Department of Wireless Communications and Signal Processing".

In Sept 2000, he joined MIT as an Associate Professor where he worked until June 2002. In June 2002, he joined Harvard University as a Professor of Electrical Engineering. He was named Perkins Professor and Vinton Hayes Senior Research Fellow of Electrical Engineering in 2005.

Dr Tarokh is the inventor of space-time codes, and has contributed to the development of many other cutting edge wireless technologies. His research results of last 18 years are summarized in about 60 research journal papers that are cited more than 21,000 times by other scholars. He was one of the Top 10 Most Cited Researchers in Computer Science according to the ISI Web of Science during every quarter for the period 2002-2008. He is an Editor, Associate Editor and Guest Editor of many IEEE and international journals, and has chaired many IEEE conferences. He is a Fellow of the IEEE. In 2002, he was named by the IEEE Communications Society as the author of one of the most important 57 papers published in society's transactions in the past 50 years, and he was also selected as one of the top 100 inventors of the year by the Technology Review Magazine, in the same year. He holds numerous awards, including the Governor General of Canada's Academic Gold Medal, in 1996, and two honorary degrees.



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**“NI LabView: Data Acquisition & Signal Conditioning”**

Tuesday, February 21, 2012 (29/3/1433H)

Time: 11:00 -- 12:00

Venue: Room 2C114, EE Department Meeting Room

**Abstract :**

Data acquisition is the automatic collection of data from sensors, instruments, and devices: in a factory, laboratory, or in the field. The purpose of a DAQ system is to measure a physical phenomenon, and convert it into digital data read by a computer for analysis and presentation. Designed for performance, NI data acquisition devices provide high-performance I/O, industry-leading technologies, and software-driven productivity gains for your application. With patented hardware and software technologies, National Instruments offers a wide-spectrum of PC-based measurement and control solutions that deliver the flexibility and performance that your application demands. For more than 25 years, National Instruments has served as more than just an instrument vendor, but as a trusted advisor to engineers and scientists around the world.

In this seminar we will talk about NI technology and the fundamentals of PC-based data acquisition and signal conditioning, how to perform different types of acquisition, how to identify the correct sensor for their measurements and how to develop integrated, high-performance measurement systems using data acquisition and NI Compact DAQ signal conditioning hardware.

**Note: All are welcome and refreshments will be served.**

**Graduate students and Senior E.E. students are strongly encouraged to attend the seminar.**

**Speaker:**

**Zahi Matar**

**Applications Engineer**

Zahi currently holds the position of Applications Engineer at National Instruments Arabia. Mr. Zahi Matar received his Engineering Diploma in Electromechanical engineering from the "École Supérieure d'Ingénieurs de Beyrouth - Université Saint Joseph", Lebanon, in June 2009. He then completed his Masters degree in Image processing at "Ecole Centrale de Paris", France in December 2010. In January 2011, Zahi joined National Instruments Arabia as an Applications Engineer providing technical support and consultation to NI's clients in the region.





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## “Opportunistic Scheduling: Centralized and Distributed Algorithms”

Tuesday, February 7, 2012 (15/3/1433H)

Time: 11:00 -- 12:00

Venue: Room 2C114, EE Department Meeting Room

### Abstract :

Opportunistic scheduling has drawn a lot of attention since its introduction. It has shown that fading is not only meant to be combat but also to be exploited. With users located at a random position in the cell experiencing independent channels, serving the user with the best channel condition, known as opportunistic scheduling, guarantees using channels at fading peak levels rather than average level. Opportunistic scheduling can efficiently utilize the wireless resources and thus dramatically improve the overall system throughput.

In this talk, I will be talking about various proposed centralized scheduling algorithms that exploit channel variations of users while minimizing the feedback load and rate. I will also consider a distributed scheduling algorithm where users access the channel based a modified slotted Aloha protocol.

**Note: All are welcome and refreshments will be served.**

### Speaker:

**Dr. Yahya S. Al-Harathi**

**Yahya S. Al-Harathi** received his B.Sc. degree from King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia, in 2000, and his Ph.D. degree from University of Minnesota, Minneapolis, MN, in 2005, all in Electrical Engineering.

During the period from 2006 until 2009, he was affiliated with the Electrical Engineering Department at King Fahd University of Petroleum and Minerals (KFUPM) as an Assistant Professor. During that, he focused his research attention on developing new opportunistic scheduling algorithms for wireless networks. He also has interest in resource allocation, random access protocols, and performance analysis and modeling of communication networks. He taught different courses with focus on Telecom.

Since 2009, he is working at Advanced Electronics Company (AEC), where he is leading the New Businesses Development group, which is focused on creating and developing new businesses and ventures, serving the organization to deliver new business growth.

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## “Ultra-wideband Antennas and Components for Wireless Communication and Imaging Systems”

Tuesday, December 27, 2011 (03/02/1433H)

Time: 11:00 -- 12:00

Venue: Room 2C114, EE Department Meeting Room

### Abstract :

Ultra-wideband (UWB) technology is rapidly developing as a high speed, and high data rate wireless communication mode. There are many challenges in dealing with this new emerging technology. One of these challenges is how to design an antenna element that can operate effectively in the entire UWB frequency range. Another big challenge is to design UWB antenna beamforming systems including suitable UWB components such as feed networks, transitions, crossovers, hybrid couplers and phase shifters to meet the UWB requirements. This presentation will focused on designing UWB antenna elements and other microwave components for UWB wireless communications and imaging applications.

**Note: All are welcome and refreshments will be served.**

### Speaker:

**Dr. Abdel Razik Sebak, IEEE Fellow**  
Research Professor, PSATRI



Dr. Sebak is a research professor with PSATRI, King Saud University on leave from Concordia University. Before joining Concordia University, he was a professor at the University of Manitoba and Cairo University. He was also with the Canadian Marconi Company, working on the design of microstrip phased array antennas.

Dr. Sebak maintained a close involvement with industry along his scientific research work. His original research contributions and technical leadership have been extensive and resulted in over 335 world class publications (including 164 over the last five years) in prestigious refereed journals and international conference proceedings. He was inducted as a Fellow of the Institute of Electrical and Electronics Engineers in 2009. He is a member of Concordia University Provost's Circle of Distinction for his career achievements. For his joint efforts in establishing one of the most advanced electromagnetic computational and antennas labs at the University of Manitoba, Dr. Sebak received the Rh Award for Outstanding Contributions to Scholarship and Research. Dr. Sebak received the 1992 and 2000 University of Manitoba Merit Award for outstanding Teaching and Research. In 1996 Dr. Sebak received the Faculty of Engineering Superior Academic Performance. Dr Sebak's recent research activities cover two streams: Antenna Engineering, and Analytical and Computational Electromagnetics. Dr. Sebak has served as Chair for the IEEE Canada Awards and Recognition Committee (2002-2004) and the Technical Program Chair ANTEM-2006.



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## “A New Framework for Reliability and Quality Performance Assessment of Power Systems”

Tuesday, December 6, 2011 (11/01/1433H)

Time: 11:00 -- 12:00

Venue: Room 2C114, EE Department Meeting Room

### Abstract :

The talk will cover a new practical framework for evaluating reliability and quality assessment levels associated with power system supply-demand balance. This framework has been developed as part of a recent major industry-supported research and development study. The novel framework is based on three metaphors (dimensions) representing the relationship between available generation capacities and required demand levels. The novel technique utilizes a basic linear programming formulation, which offers a general and comprehensive framework to assess the harmony and compatibility of generation, transmission and demand in a power system. The newly developed methodology for power system reliability performance and quality assessment has been applied to a practical power system comprising a portion of the interconnected Saudi power grid.

**Note: All are welcome and refreshments will be served.**

### Speaker:

Eng. Badr Mesned Alshammari

PhD Researcher, SEC Chair in Power System Reliability and Security (SEC-CRS)



Eng. Badr Mesned Alshammari, **Obtained his B.Sc. and M.Sc degree from King Saud University, Riyadh, Saudi Arabia in 1998 and 2004 respectively.** He is currently working toward his PhD degree at King Saud University. **He is also PhD Researcher at the SEC-CRS Chair. His main research area of interest is Power System**

**Reliability and Optimized Performance of Electricity Systems.**



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## **“Hybrid Fuel Cell and Photovoltaic Power Conditioning Systems”**

Tuesday, 25th October, 2011 (27/11/1432H)

Time: 11:00 to 12:00 AM

Venue: Room 2C114, EE Department Meeting Room

### **Abstract :**

A fuel cell and Photovoltaic solar array hybrid energy generation system with the required converters topologies for connection in parallel are proposed. A 1200 W fuel cell experimental developed model and 950 W peak photovoltaic solar array models are utilized in the simulation phase. As the fuel cell and solar array have the power quality of low voltage and high current they produce large variations in output voltage under variable load conditions, resulting in serious control problems. To use such generation profile for the standard AC low voltage level power conditioning converters are necessary required. The first stage is to step up these low voltages through step up DC-DC converters at high frequency level then the closed loop regulated output DC high voltage levels are connected in parallel and then inverted into AC form through PWM inverter, and the AC 220V at 50 Hz output is obtained through an output filter. The technique for current sharing between the fuel cell and the solar array through the DC link voltage feedback control is proposed. Modelling and simulation of the proposed system using Matlab-Simulink are established and examined.

**Note: All are welcome and refreshments will be served.**

### **Speaker:**

**Dr. Hussein Mashaly**

**SET Program, KSU**



Dr. Mashaly earned his PhD's degrees in 1995 from Ain Shams University, Egypt through scientific channel with New Brunswick University in Canada. Currently, Dr. Hussein Mashaly is a professor of Power Electronics in the faculty of Engineering, Ain Shams University, Cairo, Egypt since 2006. The research interested fields are: PV systems, Wind energy systems, Fuel cells, Electrical drives, Power Electronics converters, Switched power supplies, power quality, and artificial intelligent controller's

applications