قسم الهندسة الكهربائية
Electrical Engineering Dept

جامعة الملك سعود
King Saud University

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

PhD Defense Announcements

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Electrical Engineering Dept

Electrical Engineering Department,
College of Engineering,
King Saud University,
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Invites you all to attend a PhD Proposal Presentation

Adaptive Wideband System for Localized Hyperthermia Treatment of Cancer

Wednesday, September 9, 2015 (25/11/1436H)
Time: 12:30 – 1:30 pm
Venue: Room 2C114, EE Department Meeting Room

Abstract:

Research in cancer treatment continues to improve the efficacy of the therapeutic plans and reduce the associated side effects. Among the candidates to improve cancer treatment is the use of hyperthermia in conjunction with other modalities such as radiotherapy and chemotherapy. During hyperthermia the temperature of malignant tissue is raised between 40-45C^0. This reduces the vitality of cancer cells, and enhances the ability of the body to eradicate tumors.

Electromagnetic energy is attractive for use in non-invasive hyperthermia treatment. In particular, research is directed to target deep-seated tumors. Commercial systems use one or few applicator elements operating at a narrowband frequency range, which is typically chosen to be 433 MHz in Europe and 950 MHz in North America. Localization of energy in deep tumors with these systems is typically associated with hotspots in healthy tissues.

This research aims at developing a novel system to enhance energy localization. The system implements wideband operation to allow adaptive operation in accordance to tumor location. In addition, the system implements an array of wideband EM applicators and a Power Amplifier module for a better deposition of energy in tumor locations.

In contrast to commercial systems, the energy is distributed on a large number of multi-carriers within the bandwidth of operation from 0.3-3 GHz. However by proposing such hyperthermia treatment systems there are issues with nonlinearities of Power Amplifiers. This research aims to investigate the effect of nonlinearities on SAR and devising a linearization tool.

Speaker:

Eng. Nizam Uddin
PhD Candidate, Electrical Engineering Dept
KSU

Nizam Uddin is a PhD scholar at EE department, KSU since 2012. He received his Bachelor's degree in Electrical Engineering in 2003 from NWFP University of Engineering and Technology (UET), Peshawar, Pakistan and Masters from Edinburgh Napier University, UK in 2005 majoring Communication. He then joined academia and taught for a total of 6 years at Polytechnic Institute and National University FAST Islamabad, Pakistan. His interest areas include Antenna Theory, Bio-electromagnetics and Microwave Engineering.

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Free Space Optics for Next Generation Networks

Thursday, May 21, 2015 (03/08/1436H)
Time: 12:30 – 1:30 pm
Venue: Room 2C114, EE Department Meeting Room

Abstract:

Exponential demand of information and communication technologies motivated the research and industry communities to continue exploring, proposing, and developing more efficient and economic telecoms solutions. Free space optics (FSO) is envisioned as one of the key future communication technologies that will support this growth of demand. FSO technology has many advantages including: high data rate transmission, security, unlicensed spectrum, low power consumption, light weight and small volume in addition to quick installation and operation. This technology already has a variety of applications nowadays. It has been used for LAN to LAN connections in campus and city networks, temporal event networks (e.g., Hajj, large conferences, and sport events), disaster recovery communication links, military, suburban links, etc.

Although the many advantages of FSO technology, it still encounters many challenges that degrade the system performance. Weather conditions are among the most severe challenges that affect the FSO link reliability and limit the performance of FSO in current and next generation of wireless networks. In this proposal, we aim first to develop an empirical model for fog attenuation and distribution in FSO links. The proposed model will be compared with others in literature for performance evaluation. Then using the proposed model, we will investigate the FSO system performance in terms of SNR, BER, channel capacity, etc. In next step, we aim to theoretically and empirically model the dust attenuation in FSO links. For empirical modeling, we aim to design a lab chamber room to emulate the dusty environment. Using the achieved models, we will investigate the FSO system performance by simulation and experimentally. Furthermore, different mitigation techniques will be investigated to reduce the impairments effect. Finally, we aim to mount an outdoors FSO system to measure different weather impairments and validate the proposed models.

Speaker:

Eng. Maged Abdullah Esmail
PhD Candidate, Electrical Engineering Dept., KSU

Maged A. Esmail received his B.E. degree in electronic engineering from Ibb University in 2006 and M. Sc. Degree (with first class honors) in electrical engineering from KSU University in 2011 where he is currently pursuing the PhD degree. His research interests include fiber-optic communications, PON and long-reach PON, network management and protection, visible light communication, and free space optics.

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Rateless Space-Time Block Code for Large-Scale Multiple input-Multiple output Systems

Wednesday, 19 November 2014
Time: 12:30 pm - 1:30 pm
Venue: Room 2C114, EE Department Meeting Room

Abstract:

Multiple input-Multiple output (MIMO) communications have attracted significant research interests lately because of their ability to improve the capacity and reliability of wireless channels. An aggressive version of MIMO communications technology using hundreds of antennas, known as large-scale or massive MIMO systems, has also recently emerged and became a candidate for the fifth-generation (5G) cellular system. This emerging technology holds great potential for scaling up the wireless data rates to the Gigabit range targeted in 5G cellular system. In massive MIMO systems, large number of antenna elements, possibly hundreds or even thousands, work together to deliver huge data to multiple users on the same time-frequency resources. Although massive multi-user MIMO system provides significant capacity boosts in theory, there are still some challenges that need to be tackled in practice. These include the practical difficulties of deploying a large number of antennas on one single base station (BS), and keeping all of them in working condition all the time. Consequently, there may arise situations whereby the massive MIMO channel has lossy characteristics resulting in unreliable transmission. This gives rise to the so-called *wireless erasure channels*, or *lossy links*. In such cases, some of the transmitted data may be lost or are not decodable at the receiver. The conventional fixed-rate codes for wireless link protection do not perform well in such lossy links, especially when the transmitter does not have the channel state information (CSI). In a lossy channel, the performance of massive MIMO systems will be significantly degraded. Therefore, special techniques must be incorporated in the design of massive MIMO systems to cope with these losses whenever they arise, in order to achieve good system reliability. This is an important practical issue that has not yet been considered in any previous work in the literature on massive MIMO systems. In this proposal, a rateless space-time block code (RSTBC) will be introduced for massive MIMO systems. RSTBC will compensate for losses in a lossy wireless link, and hence guarantee high link reliability with high throughput. The study will include design, analysis and simulation of RSTBC in massive MIMO systems, both for point-to-point and point-to-multipoint scenarios. Furthermore, RSTBC will be employed to mitigate the effects of pilot contaminations in multicell massive MIMO systems. Theoretical analysis along with simulation results will be provided to demonstrate the error rate performance and the spectral efficiency of the proposed system.

Speaker:

Eng. Ali H. Alqahtani
PhD Candidate, Electrical Engineering Dept
KSU

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Modeling and Simulation of Smart Grid Integrated with Hybrid Renewable Energy System

Sunday, December 15, 2013 (12/02/1435H)
Time: 12:30 pm - 1:30 pm
Venue: Room 2C114, EE Department Meeting Room

Abstract:

In this talk, the speaker will discuss modeling of smart grid integrated with hybrid renewable energy system. The hybrid system includes PV arrays, wind turbines, diesel generator and battery banks as energy storage system. A proposed technique will be introduced to determine the optimal size of a hybrid renewable energy system based on smart grid theory. Optimal sizing of each component of the hybrid system takes unpredicted long time of calculations. Use of Particle Swarm Optimization (PSO) technique can save most of the time consumed in linear computations. The speaker will also introduce a demand-based generation control framework for smart grid operations. This framework attempts to help the current outage management system by creating a model that allows an intuitive power demand control analysis under varying consumer demand and cost requirements. The smart control framework will optimize the power generation by perfectly tracking the load demand fluctuations, yielding superior economical benefits under uncertain renewable energy sources.

Note: Graduate students are recommended to attend this seminar.

Speaker:

Eng. Mohamed Abdelaziz
PhD Candidate, Electrical Engineering Dept.
KSU

Eng. Mohamed received the B.S. degree in Electrical Engineering (Power & Machines), from Electrical Engineering Dept., Faculty of Engineering, Minia University, El-Minia, Egypt, (July 2006). He received MSc. in Electrical Engineering from Electrical Engineering Dept., Faculty of Engineering, Minia University, El-Minia, Egypt, (May 2010). Currently he is a PhD candidate at the Electrical Engineering Department at KSU.

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Development of High Efficiency Microinverter for Solar PV Applications

Wednesday, September 25, 2013
Time: 12:30 pm -- 1:30 pm
Venue: Room 2C114, EE Department Meeting Room

Abstract:

In this talk, I will discuss the development of a Microinverter for solar PhotoVoltaic (PV) applications. Microinverter (MI) is an active area of research in the field of solar PV and there are a lot of areas where the use of MI can be very effective. The proposed work is focused towards the development of new configurations of MI for solar PV applications. The concept of Maximum Power Point Tracking (MPPT) will also be discussed. I will review the principle advantages of such a PV system and point out some of the performance limitations that shadow these advantages. A novel technique for MPPT will be explained with the help of simulation results. Finally I will present the research objectives of this thesis, intended to tackle some of these performance issues utilizing state- of-the-art simulation methods.

Note: Graduate students are recommended to attend this seminar.

Speaker:

Eng. Hadeed Ahmed Sher
PhD Candidate, Electrical Engineering Dept
KSU

Eng. Hadeed Ahmed Sher received the B.Sc. Electrical Engineering and M.Sc. Electrical Engineering degrees from Bahauddin Zakariya Univeristy, Multan, Pakistan and University of Engineering and Technology, Lahore , Pakistan in 2005 and 2008, respectively. He then joined Dewan group of Industries and worked there for a year. In 2007 he joined the faculty of engineering University of Central Punjab as a lecturer. In 2010 he joined KSU as a PhD researcher and is currently working towards his Doctoral studies in the Department of Electrical Engineering. His field of interest includes Renewable Energy Systems, Power Electronic Converters, Power Quality and Machine Drives.

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Compressed Sensing Based Processing for Multiband/Multi-frequency Passive Radars

Saturday, May 18, 2013 (08/07/1433H)
Time: 12:30 pm -- 1:30 pm
Venue: Room 2C114, EE Department Meeting Room

Abstract:

In this talk, I will discuss the development of a software defined passive radar system that utilizes existing RF signals from the environment produced by different communication and broadcast systems (e.g., FM, GSM, and DTV). I will review the principle advantages of such a radar system and point out some of the performance limitations that shadow these advantages. Finally I will present the research objectives of this thesis, intended to tackle some of these performance issues utilizing state- of-the-art signal processing methods.

Note: Graduate students are recommended to attend this seminar.
Refreshments will be served.

Speaker:

Engr. Muhammad Abdul Hadi
PhD Candidate, Electrical Engineering Dept
KSU

Eng. Muhammad Abdul Hadi received the B.S. degree from Bangladesh University of Engineering and Technology (Dhaka) in Electrical and Electronic Engineering in 2000. In 2000, He joined as an instructor at Bangladesh Institute of Technology, Gazipur, Bangladesh. He later finished his dual-M.S. degree in Electrical Engineering and Materials Engineering specializing in RF devices and Electromagnetic materials from The Ohio State University, USA in 2004. From 2005 to 2007, he worked as researcher for Electrical Capacitance Tomography Group at the same university performing simulations and hardware development of the ECT sensors. Since the beginning of 2008, he has been a lecturer with PSATRI, at KSU participating in various research projects. Currently he is a PhD candidate at the Electrical Engineering Department at KSU.

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Design and Implementation of Ultra Wideband (UWB) Modules for Phased Array Antenna

Tuesday, Jun 05, 2012 (15/07/1433H)
Time: 11:00 am -- 12:00 pm
Venue: Room 2C114, EE Department Meeting Room

Abstract :

In this talk, I will discuss the development of Ultra Wideband (UWB) modules for phased array antenna and its design challenges. Then I will review the main topics related to different phased array configurations including its feed networks. I will also cover UWB technology and its applications, UWB phased array components such as UWB antennas, UWB phase shifters and UWB hybrid coupler. Finally, I will present the research objectives and thesis plan.

Note: All are welcome. Refreshments will be served.

Speaker:

Engr. Muhammad Ahmad Ashraf
PhD Candidate, Electrical Engineering Dept
KSU

Eng. Muhammad Ahmad Ashraf received the B.S. degree from University of Engineering and Technology Lahore (Pakistan) in Electrical Engineering in 2003. He later finished his M.S. degree in the same field from National University of Science and Technology (NUST-Pakistan) in 2008. He has been working in NESCOM (a public sector defense organization) from 2003 to 2007. He has worked as a Lecturer in NU-FAST Islamabad from 2007 to 2008. By the end of 2008, he joined the Electrical Engineering Department at KSU as PhD student.

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"Multi-Format Optical Transmission System for Next Generation Terabit Networks"

Tuesday, May 29, 2012 (08/07/1433H)
Time: 11:00 am -- 12:00 pm
Venue: Room 2C114, EE Department Meeting Room

Abstract :

In this talk, I will discuss the recent specifications of optical fiber networks and show the future directions of research related to this topic. Then I will review the main points/subtopics related to the advances in optical fiber networks. This will include; the advances in access/metro networks, optical modulation techniques, and optical fiber channel impairments. Finally, I will present the research purpose and thesis plan.

Note: All are welcome. Refreshments will be served.

Speaker:

Engr. Amr Mohamed Ragheb
PhD Candidate, Electrical Engineering Dept
KSU

Engr. Amr Mohamed Ragheb.
Amr Ragheb received the B.S. degree from Tanta University (Egypt) in Electrical Engineering in 2001. He later finished his M.S. degree in the same field from Tanta University in 2006. He has worked as a Teaching Assistant in Tanta University from 2003 to 2008. By the end of 2008, he joined the Electrical Engineering Department at KSU as PhD student.