

Wireless Geophone Sensing for Oil and Gas Exploration: Challenges and Opportunities

Date: Tue. 11th Feb.

Time: 1:10 pm

Location: Building 59, Room 2016

Speaker:

Dr. Feras Al Dirini

Assistant Professor EE Department

KFUPM

Abstract:

This tutorial-style seminar will present the challenges and opportunities towards the realization of wireless geophone sensor networks for real-time seismic data acquisition. The realization of wireless geophone sensor networks is a highly-sought-for endeavor intended for application in active seismic surveys for oil and gas exploration, however, there are numerous design challenges that impede the achievement of such an endeavor according to the industry's requirements and desires. This seminar tries to highlight where the bottlenecks are on the system level, shedding more focus on the hardware side of the sensor nodes, which constitute the network's fundamental building blocks. A preliminary first-generation hardware prototype of a smart geophone sensor network, which was designed and implemented at KFUPM, will be presented. Finally, the seminar will conclude by presenting opportunities for graduate students to get involved in the design and development of the second-generation of the system, and work within a multi-disciplinary research team composed of multiple EE faculty members, under the Center of Energy and Geo-Processing (CEGP) at KFUPM, with further opportunities for collaboration with EE faculty from the Georgia Institute of Technology as well as major global industry giants.

Bio:

Dr. Feras Al-Dirini joined the Electrical Engineering Department at KFUPM in September 2017, as an Assistant Professor, coming from the University of Melbourne in Australia, where he was working in the Electrical and Electronic Engineering Department since 2015. Dr. Al-Dirini completed the PhD degree in Electrical and Electronic Engineering at The University of Melbourne - Australia in 2015 and the B.Sc. degree in Electronics Engineering at Princess Sumaya University for Technology - Jordan, with the highest honors, in 2011. From 2009 to 2010, he was an exchange student at the University of Illinois at Urbana-Champaign - USA, and in the summer of 2009, he was a Research Intern with the Institute for Microsystems Technology, Technical University of Hamburg-Harburg - Germany. His research interests are in Nano electronics, Nanotechnology, Intelligent Electronics and Intelligent Sensors. Since joining KFUPM in 2017, he has focused his efforts towards establishing a research program on Intelligent Electronics (next-generation hardware technologies for energy-efficient machine intelligence) and their use in novel applications, such as Intelligent Sensing. Dr. Al-Dirini was a recipient of the Australian Postgraduate Award and the National ICT Australia Ph.D. Top-Up Scholarship from 2011 to 2015. He also received numerous prestigious regional awards by IEEE, such as the IEEE Darrel Chong Award, for his volunteer leadership service during his early years as a student for a number of impactful regional contributions he made, such as his inception of the IEEE Middle East Student Branch Congress (ME-SBC) in 2009, which later developed to become the IEEE MESYP. He also received the Princess Sumaya Scholarship between 2007 and 2011 and the Edexcel International High Achiever Award for topping all A-Level GCE examinees in Jordan. He is a member of the IEEE and a member of the Australian Nanotechnology Network.