UNIVERSITY of BRADFORD
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BRITISH COUNCIL

Department for Business Innovation & Skills

SITARA

CORNING

The Society for Broadband Professionals

Skills for Success

'Meet the Industry' Day

Wednesday 13 April 2016

Norcroft Centre, University of Bradford

LECTURE PROGRAMME

08.30 **Registration, Coffee and Table-Tops**

09.05 - 09.15 **Welcome by Mike Thornton, President, SCTE™**

09.15 - 09.30 **Keynote: "Transformation: A Connected World"**

09.30 - 10.10 **"The Inside (and Outside) Story of Optical Fibre Design for Access Networks"**

Ian Davis, Optical Fibre Regional Marketing Manager, Optical Fibre, EMEA, Corning Limited

Recent advances in optical fibre design have led to the development of several fibre designs that are particularly well suited to fast growing access areas of the network. Certain features are more suited to the outdoor part of the network, others become of more importance when moving inside the building. Corning will describe these advanced designs and discuss how they may advance the roll-out of FTTx deployments.

10.10 - 10.50 **"Aeronautical Communications for a Connected Sky"**

Professor Y. Fun Hu, Faculty of Engineering and Informatics, University of Bradford

This presents an aeronautical communications architecture and a Radio Resource Management (RRM) scheme to support seamless aeronautical networking, subject to security constraints. The RRM mechanism exploits the IEEE 802.21 Media Independent Handover (MIH) framework and the ETSI Broadband Satellite Multimedia (BSM) SI-SAP concept to split the RRM functions between the upper layers (layer 3 and above) and the lower layers (link layer and physical layer) of an aircraft communications' terminal. The upper layer functions are managed by an Integrated Router (IR) on-board the aircraft and lower layer functions are provided by an on-board Integrated Modular Radio (IMR) consisting of heterogeneous radio access technologies. A Joint Radio Resource Manager (JRRM) provides the abstraction layer between the IR and IMR for mapping higher layer functions into lower layer functions to enable efficient collaboration across the two devices.

The specification and design of the RRM scheme is used to maintain a close collaboration between the IR and the IMR to perform connection establishment functions and support seamless handovers between different radio technologies. A detailed description of the RRM architecture, mechanism and the Message Sequence Charts (MSC) for session establishment and hand-over management are presented.

10.50 - 11.00 **Questions**

11.00 - 11.45 **Coffee Break and Table-Tops/Coffee (Exhibition Room)**

11.45 - 12.25 **"Innovation – Connecting the Unconnected World"**

Ade Brittain, Technologist – CAO, Liberty Global/Virgin Media

- **Rural Digital Divide** - What progress has been made in recent years?
- **Investment** - How Liberty Global and Virgin Media are investing in technology and infrastructure to expand its network.
- **IOT** - How can the Internet of Things exist if not all "things" have fast internet access yet?
- **IOT, Big Data and Machine Learning** - how innovative, new products and contextual services can add value to our lives and businesses.
- **Challenges** - What are the challenges we still need to overcome?

12.25 - 12.30 Questions

12.30 - 14.00 Lunch and Table-Tops (Exhibition Room)

14.00 - 14.40 "Secure Communications for Modern Power Systems"

Dr. Prashant Pillai, University of Bradford

Smart Grid technology facilitates the integration of storage and renewables with the grid to ensure sustainability of electricity supply, mitigate rising power outages and help meet the rapidly rising demand for clean energy in urban and rural areas. Reliable, rapid and secure communication infrastructure is required to attain these smart grid benefits. Several communication architectures and protocols have been defined for efficient smart grid communications using terrestrial telecommunication technologies.

ETSI Open Smart Grid Protocol, DNP-3, IEC 61850 etc. defines the communications between devices in transmission, distribution and substation automation systems. IEC 62351 defines cyber security for the communication protocols defined by the previous four sets. This talk will examine existing communication technologies such as mobile (3G/4G), satellite and cable and discuss how these can be used for smart grid communications. It will also introduce the security and QoS requirements for smart grid communications and present the integration of satellites with terrestrial communications for the purpose of connecting virtual power plants. Key security vulnerabilities, types of attacks and arising security challenges will be detailed.

14.40 - 15.20 "Network and In-Home RF Cable Connectorisation - The Hidden Demons Exposed. How Could the Industry Have Got It So Wrong?"

Keith Mothersdale, Technology Director, Passives and Indoor, Teleste Limited

Broadband cable MSOs are constantly striving to improve service reliability and overall customer experience. Historically, investment in the head-end and transmission network has been given priority, and the drop connection has been seen as a commodity. However, when it comes to maintenance costs, the situation is reversed as the head-end and transmission is all high quality and requires less maintenance investment. The drop, however, is deployed in tens of millions of connections and each connection that becomes a truck roll suddenly requires massive investment and incurred costs.

A small passive splitter, a low cost connector and some coaxial cable form the gateway to the two-way cable network and suddenly this low cost drop connection to the customer becomes very expensive and problematic. Multiply this by a few million issues per annum, and the costs are astronomical as well as resulting in lost customers and increased churn.

Teleste has spent the past two years researching the drop issues and, in particular, the most expensive truck roll issues relating to "no faults found". Teleste believes that it has found the hidden demons relating to one of the last major issues in the drop and will be presenting its findings.

15.20 - 15.30 Questions

15.30 - 16.15 Coffee Break and Table-Tops (Exhibition Room)

16.15 - 16.55 "Optimisation-Based Class F Power Amplifier for GSM Systems"

Nabeel A. Abduljabbar and Raed A. Abd-Alhameed, School of Engineering and Informatics, University of Bradford

Today, the world is witnessing a revolution in the field of communications. Wireless communication and mobile phone systems have spawned the smart phone which, in addition to dial-up, has now become a means of communication, transferring data and images, browsing the Internet, satellite communication and for GPS. The Class F power amplifier is one of the switching mode amplifiers which has high efficiency and output power compared to other switching mod amplifiers.

The linearity problem associated with the Class F amplifier has been discussed in recent work in which CDMA modulation was considered. It should be noted that the load circuit plays the main role in the linearity, efficiency and complexity of the circuit of the Class F amplifier. The load circuit is responsible for developing the voltage and the current wave shaping, decreasing the interference between them, matching the load with transistor output and decreasing the effect of the parasitic elements to improve amplifier linearity. The goal of this research work is to design a one-stage class F amplifier with linearity and efficiency suitable for the GSM system.

The Class F amplifier is designed to work with GSM systems using an optimisation technique based on input and output impedances, the optimum operation point of the amplifier and a wave-shaping circuit to fulfil design goals of the efficiency and linearity.

16.55 - 17.00 Questions

17.00 - 18.00 Cocktail Reception and Table-Tops (Exhibition Room)

Register today for free at **http://goo.gl/91eqAz**
or email **office@thescte.eu**