IEEE Northern Canada Section

IEEE Canada
Northern Canada Section

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IEEE NCS

We aim to promote the vision of the IEEE within the membership in our region through sharing of ideas, attendance at conferences and workshops, and ethical practice. The section supports Chapters, special interest groups, student activities and student awards.

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Professional/Career Activities/Ft McMurray	Harshul Srivastava/Luc Gallant

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IEEE-NCS Presents
Saturday, August 17th, 2013, 1:00 pm to 5:00 pm
Summer BBQ

Annual IEEE Northern Canada Section Barbeque was hold at Victoria Park Site 6 in Edmonton at August 17 from 1 to 5 pm. This event was free to IEEE members and their families.

IEEE NCS BBQ - August 17, 2013

IEEE NCS Com/Comp Jt. Presents

Friday, August 23th, 2013, 5:50 pm

IEEE Tech Night

Speakers: Daniel Haight President of Darkhorse Analytics and Michael Bowling Professor at Computing Science department of U of A

Daniel Haight walks the line between business and academia. He's an award-winning sessional lecturer at the Alberta School of Business, managing director of a research centre, and the founding partner of Darkhorse Analytics. He started his career at Mercer Management Consulting in Toronto advising senior management and jet-setting around the continent. Subsequently, he nearly made millions of dollars in a small Internet start-up. Dan graduated from the U of A with a Bachelor of Commerce in Business Studies.

Michael Bowling is a professor at the University of Alberta. His research focuses on machine learning, games, and robotics. He is the leader of the Computer Poker Research Group (CPRG), which has built some of the best poker playing programs on the planet. The programs have won international AI competitions as well as being the first to beat top professional players in a meaningful competition. Michael received his Ph.D. from Carnegie Mellon University. His research has been featured on the television programs Scientific American Frontiers, National Geographic Today, and Discovery Channel Canada, as well appearing in the New York Times, Wired, on CBC and BBC radio, and twice in exhibits at the Smithsonian Museums in Washington, DC.
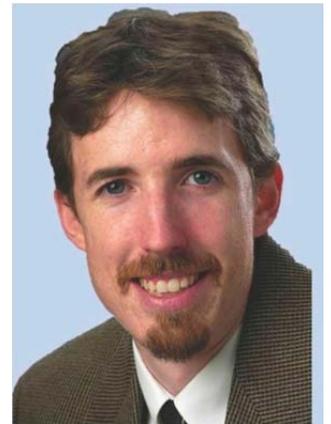
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IEEE-NCS, IAS/PES Presents
Tuesday, October 1st, 2013, 6:00 to 9:00pm, doors open at 5:30pm

Grounding and Bonding – A Code Perspective

"This workshop clarified fundamental aspects of electrical system and electrical equipment grounding, and equipment bonding. Discussion touched on confusion related to the question whether the bonding, grounding and neutral conductors carry a fault current, on grounding requirements for numerous electrical systems in a building, on specific provisions for bonding and grounding in HV installations The discussion will also elaborate on differences between the safety requirements for bonding and grounding and good engineering practice."

To promote the Graduates of the Last Decade (GOLD) there was a 15 minute opening presentation from a GOLD Guest Speaker on Harmonic emission of DFIG-based wind farms.

Speaker:
Arkady Tsisserev

Location:
German Canadian Cultural Centre
8310 Roper Road, Edmonton

GOLD Speaker:

Abstract-Harmonic emission of DFIG-based wind farms

The Type 3 Induction Generator, also referred to as Doubly-Fed Induction Generator (DFIG), is one of the most popular generator types used for wind generation applications. This presentation focused on the harmonic emissions from DFIG-based wind farms. In the first part of the presentation, the DFIG operation principles were covered. A Pulse Width Modulation (PWM) switching scheme was presented and a method to calculate the associated characteristic harmonics was provided. In the second part of the presentation, simulated models were used to characterize the harmonic emissions.

These harmonic injections were compared with those of more well-known harmonic sources such as DC drives, Plug-In Electric Vehicle chargers and residential service transformers. This comparison was done through the presentation of two case studies.

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IEEE-NCS, IAS/PES Presents

Tuesday, November 5th, 2013, 5:30pm to 9:00pm, doors open at 5:00pm

Power System Protection Coordination/To Make Smart Meters Smart

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Abstract:

Our November Technical Seminar was a joint presentation that included two parts. The two parts address our members request to discuss the subject as indicated in the title. Each Part was presented as follows:

Part 1: (Rasheek Rifaat, P.Eng, Sr. Member IEEE): Protection System Coordination for Distribution and Industrial Power Systems

Part 2: (Peter Sutherland, Fellow IEEE): Selectivity and Zone Selective Interlocking for Low Voltage Circuit Breakers

Part 1: Since the inception of industrial electrical systems, coordination tasks were performed to ensure that protection systems would operate with the necessary reliability and security. The tools to perform such tasks have evolved from the use of a glass table with light and log-log curve sheets into computer base programs with GUI. Meanwhile, protective devices have also gone through advancements from the electromechanical devices to the multifunction, numerical devices. Throughout the changes in coordination tools and protective device configurations, a good number of protection coordination principles remain with us. In addition, new techniques are developed to assist us the use of protection system to reduce arc flash energy in addition to basic protection functions. Part 1 will discuss the principles and basics of protection system coordination, the developments in the coordination programs and present day multifunction numerical devices used in distribution and industrial systems.

Part 2: Time Current curve overlays are no longer sufficient for performing protective device coordination studies. In 2005, National Electrical Code articles 700.27 (Coordination for Emergency Systems) and 701.18 (Coordination for Legally Mandated Standby Systems) first required fully coordinated systems. Due to arc flash and electrical safety concerns, turning instantaneous off, increasing delay times or increasing pickup currents are no longer good enough. Industry has responded by publishing selectivity tables as a tool in addition to traditional curve overlays. Analytical methods such as peak let-through analysis are often used to generate tables. Selectivity tables assume upstream CB s instantaneous trips are set to maximum or off. There are now multiple methods to achieve selectivity, while still using

instantaneous protection set at low sensitive pickups, all the way to the first MV devices. These include: Energy nesting, WFR (Waveform Recognition) and I-ZSI (Instantaneous Zone Selective Interlocking). These methods allow for meeting the combined goals of arc flash reduction and fully coordinated systems.

GOLD Speaker:

To promote the Graduates of the Last Decade (GOLD) we have a 15 minute opening presentation from a GOLD Guest Speaker on To Make Smart Meters "Smart"

Make Smart Meters "Smart" Are smart meters truly smart yet? Utilities and meter manufacturers keep claiming that smart meters can help ordinary customers understand their energy usage patterns better and further reduce their bills. However, the key step to achieve this is to know the energy consumptions of individual appliances in your house, not the total consumption. A new technology based on artificial intelligence has been developed in U of A to make this possible. It can be integrated with future smart meters to make them truly smart.

IEEE-NCS, AP/MTT Jt. Presents
Friday, November 8th, 2013, 2:00 PM to 3:00 PM
Distinguished Lecturer: Prof. Yahia Antar

Abstract

Microwave and millimeter wave antennas are vital components for wireless and satellite communications, radars and other sensors, and many other emerging applications. The presentation will start by introducing some research activities at the Royal Military College of Canada that address recent and emerging research directions in the field. This will be followed by describing a new class of one and two dimensional printed leaky wave antennas. Leaky wave antennas form one type of traveling wave antennas in which an aperture is illuminated by the fields of a traveling wave. Usually a leaky wave stems from a close guiding structure that supports traveling waves but has some means of continuous power leakage into the exterior region. The illuminated aperture extends over several wavelengths and is limited by wave attenuation caused by power leakage.

The basic properties of leaky wave antennas were founded in the pioneering work of Tamir and Oliner back in the early 1960s and later in the work of Jackson and Oliner. Recently, the need for high gain printed antennas has revived interest in leaky waves resulting in a great number of papers on printed leaky wave antennas. In here we discuss leaky waves analytical properties and their supporting structures. A new coplanar surface wave-based launcher feed system for direct excitation of leaky waves is described. Various high gain planar antenna configurations with partially reflecting screens will be studied in detail as examples of new scanning leaky wave antenna structures. Analysis of some of these structures reveals the main properties of leaky wave antennas and provides some physical insight into their nature and future potential developments. In addition, and based on the unique properties of the newly developed surface wave launchers, a new way of designing associated microwave guiding structures for integration with antennas or for use on their own in microwave circuits is presented.

IEEE-NCS, AP/MTT Jt. Presents
Thursday, November 28th, 2013, 2:00 PM to 3:00 PM

Distinguished Microwave Lecturer: Prof. F. M. Ghannouchi

Abstract

Data traffic and wireless applications have experienced exponential growth; and, in order to cope with the demand for higher capacity, the numbers of base stations and networks are increasing rapidly. This increase raises several cost and environmentally related challenges for wireless network infrastructure providers and operators, as well safety related concerns for users and government regulators. In order to reduce operating costs and minimize the carbon dioxide (CO_2) emission footprint of communication networks, many wireless infrastructure providers and operators have been highly active in investigating new approaches and techniques to reduce energy consumption of base stations, mobile terminals and communication networks with the aim of implementing and deploying power-efficient "green" radio architectures and smart-grid wireless communication networks. This talk will highlight the why it important to reduce power consumption of communications network and how we can achieve it by adopting a holistic and end-to-end-comprehensive approach, crossing the different layers of the Open System Interconnection (OSI) model.

IEEE NCS, Student Branch Presents
Friday, November 29th, 2013, 4:00pm to 6:00pm

Syncrude - IEEE Networking Super Session

The IEEE Student Branch hosted their annual Networking Super Session (NSS) on November 29, 2013 from 4:00pm to 6:00pm in the ETLC Solarium. This was a semi-formal, fully catered event intended to foster interaction between students and industry. Companies had sent representatives from various disciplines.

A brief list of companies attended includes:
- ABB
- Alberta Innovates
- ATCO Electric
- Bantrel
- Graham Construction
- Computronix
- EMC
- Stantec
- ...and many more!