



IEEE

South Saskatchewan Section

**IEEE South Saskatchewan Section
Annual Report
2021**

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1. Message from Section Chair

I am pleased to welcome you to the IEEE South Saskatchewan section. With the support of our section's Executive Committee (EXCOM) members, we have achieved all of our goals for 2021. One of the most challenging tasks during 2021 was keeping members engaged and active during the virtual mode of operation. Our section has maintained members' engagement in various IEEE activities including, monthly meetings, seminars, and virtual social events. Between March and October 2021, the section had five virtual seminars and events, including the AGM. In 2021, the section established the IEEE Women in Engineering (WIE) Affinity Group. In 2020, the IEEE Student Branch ceased its activities due to the COVID-19 pandemic. We set out plans to reactivate the IEEE Student Branch in 2022. In cooperation with the North Saskatchewan section, the IEEE South Saskatchewan continued planning to host the 2023 annual IEEE Canadian Conference on Electrical and Computer Engineering (CCECE). Like other sections in Region 7 and around the world, we have experienced issues with membership retention due to the COVID-19 pandemic. However, in 2022, the section has made it a priority to deal with membership retention and growth. In 2022, the section will lead the effort in organizing the CCECE 2023. One of the section's goals in 2022 is to transition back to face-to-face activities, address the declining membership, and increase members' engagement. I take this opportunity to thank the EXCOM members for their hard work and dedication.



2. Executive Committee Officers



Irfan Al-Anbagi
Chair



Raman Paranjape
Vice-Chair



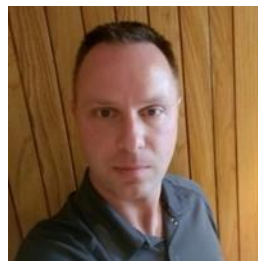
Kin-Choong Yow
Secretary



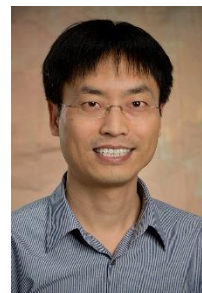
Moeed Shamim
Treasurer



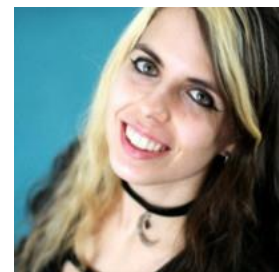
Shahedur Rahman
Membership
Development



Brent Maksymiw
Membership
Dev. (Co-Chair)



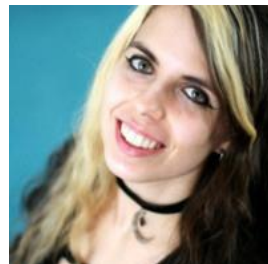
Zhanle Wang
Professional
Activities



Tessa Herzberger
Educational
Activities



Aditya Pathak
Student Activities



Tessa Herzberger
Grad Student Rep



Victor Edoho
TISP Coordinator



Adam Tilson
Regina Eng. Soc. Rep



Moeed Shamim
eNotice Coordinator



Moeed Shamim
vTools Coordinator



Adam Tilson
Webmaster



Doug Wagner
Student Branch Advisor

3. Chapters and Affinity Group Officers

South Sask Section Computer Chapter



Adam Tilson
Chair

South Sask Section Power & Energy Society (PES)/Industrial Applications Society (IAS) Joint Chapter



Usman Munawar
Chair

South Sask Section Young Professionals (YP) Affinity Group



Jason Whitelaw
Chair



Mohamed Ahmed
Vice-Chair

South Sask Section Women in Engineering (WIE) Affinity Group



Reagan Ong
Chair



Kaylee Tumack
Vice-Chair

4. Financial Report

Income Statement Detail FY 2021

Ordinary Income/Expense

Income		
2.00 - 2 Prog Rev		\$508.09
2.10 - 10 Meetings & Other	\$2.07	
2.70 - 70 Professional Activities & Other	\$506.02	
3.00 - 3 Other Recpt		\$4,760.77
3.10 - 10 Rebate from IEE	\$4,756.42	
3.40 - 40 IEE CB Account Interest	\$3.31	
3.70 - 70 Other Income	\$1.04	
Total - Income		\$5,268.86
Expense		
4.00 - 4 Prog Exp		\$2,968.75
4.10 - 10 Meetings & Other	\$2,074.06	
4.10.000 - 000 Meetings	\$426.13	
4.10.010 - 010 Section Meeting	\$1,647.93	
4.15 - 15 Subunit Support	\$60.93	
4.30 - 30 Advertising Expense – IEE	\$372.96	
4.60 - 60 Educational Activities & Other	\$97.07	
4.70 - 70 Professional Activities & Other	\$363.73	
5.00 - 5 Other Mgmt & Gen Exp		\$95.53
5.20 - 20 Travel Expense & Other	\$94.84	
5.60 - 60 Management & Other Expenses	\$0.69	
Total - Expense		\$3,064.28
Net Ordinary Income		\$2,204.58
Net Income		\$2,204.58

Balance Sheet FY 2021

Assets	
Cash	\$40,798.06
Total Assets	\$40,798.06
Liabilities and Net Assets	
Reserves	\$35,000.00
Total Liabilities	\$35,000.00
Net Assets	
Operating Funds	\$5,798.06
Total Net Assets	\$5,798.06
Total Liabilities and Net Assets	\$40,798.06

5. Reports

5.1 Membership Development

As of November 17, 2021, we have a total of 78 members in the following grades:

Grade	Number
Affiliate	2
Graduate Student Member	15
Life Member	9
Life Senior	3
Member	59
Senior Member	9
Student Member	10
Grand Total	107

New members

Among them, we have 24 new members (grade effective date after 1 Jan 2021 and not previously a member at other grades).

Membership upgrades

The following members were upgraded to Senior Member in 2021:

- Mr. Iain Wright
- Dr. Kin-Choong Yow

Congratulations to Iain and Kin-Choong!

5.2 Women in Engineering Affinity Group

The Women in Engineering (WIE) Affinity Group was officially approved in April 2021. Thank you to Reagan Ong (Chair) and Kaylee Tumack (Vice-Chair) for their efforts in the Protom Committee!

5.3 Events

The following events were jointly organized by the IEEE South Saskatchewan Section, IEEE South Saskatchewan YP Affinity Group, IEEE South Saskatchewan WIE Affinity Group, IEEE South Saskatchewan PES/IAS Joint Chapter and the IEEE South Saskatchewan Computer Chapter.

1) Webinar: **Infrastructure Asset Management with Power System Applications**

Monday 25 Jan 2021, 10:00am to 11:00am CST

Abstract: The value of making smart decisions gives a reason for adopting Asset Management (AM). AM is defined as a coordinated activity of an organization to realize value from assets. The first step of AM is always the motivation. This tutorial introduces the concepts of AM and maintenance as a strategic tool for AM. Furthermore it gives a thoroughly presentation of the systematic method for performing maintenance that are the reliability centered maintenance (RCM) and the quantitative method of reliability centered asset management (RCAM). A focus for the tutorial is on the data needs. The presentation concludes with a case study for wind power turbines. It present an anomaly detection approach based on machine learning technique and data from alarms and the Supervisory Control And Data Acquisition system (SCADA). The results shows that the proposed approach can detect potential wind turbine failures at an early stage.



Speaker Profile: Dr. Lina Bertling Tjernberg is Professor in Power Grid Technology at the Royal Institute of Technology (KTH) and is the Director of the Energy Platform. Her research aims to develop models for electric power solutions for the future sustainable energy system. Areas of special expertise are in applied reliability theory and maintenance management. Dr. Bertling Tjernberg has previously been Professor at Chalmers University of Technology in Sustainable Power System and the Head of the Power System Group, and with the Swedish National Grid as Director of the Research and Development.

Dr. Bertling Tjernberg is a Senior Member of IEEE and is a Distinguished Lecturer of IEEE PES. She has been the Chair of the Swedish PE/PEL Chapter (2009-2019) and has served in the Governing Board of IEEE PES (2012-2016). She has been an Editor for the IEEE Transactions on Smart Grid Technologies and chaired the first IEEE ISGT Europe Conference. She is a standing committee member of the world energy council (WEC), is a member of the National Strategic Council for Wind Power and is part of the expert pool for the EU commission within Energy, ICT and Security. She has published over 100 papers and a book for CRC Press [*on Infrastructure Asset Management with Power System Examples., 2018.*](#)

2) Webinar: **Improving Mine Safety with an Underground Wireless Positioning System**

Tuesday 30 Mar 2021, 5:00pm to 6:00pm CST

Abstract: In May 2019 Saskatchewan Polytechnic, with support from International Minerals Innovation Institute (IMII) began developing an underground wireless positioning system to enhance mine safety. The prototype system had a goal of identifying the positions of people and equipment in an underground mine to within 30 cm of the actual location. This presentation will present an overview of the project, the developed prototype system, the preliminary results and description of the on-going research. The project news release can be found online: [Project News Release](#)



Speaker Profile: Colleen Patterson is currently a Senior Research Associate with Saskatchewan Polytechnic. She has a BSc in Electrical Engineering from the University of Saskatchewan and an MEng in Electrical Engineering from Carleton University. Prior to moving into applied research, Colleen started her career working on wireless based systems in various applications. From there she moved to the semi-conductor industry working on a variety of different chips. Most recently, Colleen has worked in Product Management to define new products and lead multi-functional teams to bring new products to market.

3) Webinar: **Hardware, Software and Applications for Real Time Evaluation & Testing of The Evolving Smart Power Grid**

Tuesday 15 Jun 2021, 5:00pm to 7:00pm CST

Abstract: “Keeping the lights on”, an axiom in power systems engineering has taken on a new level of complexity with increasing pressure on the existing network to deliver more power over existing infrastructure. The RTDS Real Time Digital Simulator is a powerful tool in adapting new technology to the power grid, through control hardware, and power (CHIL, PHIL) hardware in the loop testing in real time. The custom-developed hardware allows simulation to be done in parallel with maximum speed and efficiency. Combined with the user-friendly GUI and industry-approved simulation results, engineers can validate the performance of the evolving power system and de-risk deployment. The first component of this presentation will take the audience through the hardware and software that provides this simulation platform, then applied to various power systems applications in real time. The second presentation presents the development and testing of a wide-area measurement based transient stability prediction system using the RTDS system and applying intentional islanding to prevent large-scale blackouts.



Speaker Profile: Shane Jin received his B.Eng. (Hons.) degree in electrical engineering from the Beijing Institute of Technology (BIT), Beijing, China. He received his M.Sc. and Ph.D. degrees in electrical engineering from the University of Saskatchewan, Saskatoon, SK, Canada, in 2012 and 2020, respectively. In 2017, he joined RTDS Technologies Inc. as an Engineer, Protection & Automation. His work focuses on research, design, and development of protection and automation products using smart grid technologies. He actively participates in various IEC/IEEE working group activities regarding IEC 61850, PTP, PMU, DNP standard development.



Speaker Profile: Ramakrishna Gokaraju received his Bachelor of Engineering degree (with Distinction) in Electrical and Electronics Engineering from the National Institute of Technology, Trichy, India in April 1992. He received the M.Sc. and Ph.D. degrees in electrical and computer engineering from the University of Calgary, Calgary, AB, Canada, in 1996 and 2000, respectively. During 1999-2002, he was a Research Scientist with the Alberta Research Council and a Staff Software Engineer with IBM Toronto Lab. He joined the Department of Electrical & Computer Engineering at the University of Saskatchewan as an Assistant Professor in 2003 and is currently a professor in the department. His current research works are in high speed digital relaying, controlled islanding, fault detection in ac-dc

systems, impact of inverter-based resources on protection, and sustainable energy systems (including SMR based generation).

4) Webinar: **Modern Grid and Dynamic Systems Resilience, Sustainability, Protection and Operation**

Thursday 16 Sep 2021, 2:00pm to 3:30pm CST

Abstract: The Electric power industry continues to transform at an accelerating rate. Demand for bundled load is on decline which directly affects the supply side. Cascading failures present severe threats to power grid reliability and security.

Resilient grid is a paradigm shift which requires a new line of thinking in the engineering, infrastructure, managing reliable operation and maintenance of the grid. The importance of modern electricity grid for sustainable delivery of reliable, communicative, and high-quality electricity is paramount.

- Characteristics and behavior of the system are changing. Renewable energy source (RES) intermittency has introduced challenges in dispatching mix impacting load forecasting, voltage spikes, frequency excursions, and cyclic operation of thermal plants.
- Balancing energy sources to efficiently operate the grid, minimize exposure to cascading events and need for oscillatory stability management are amongst key operational objectives.
- Timely detection, mitigation and prevention of cascades of disturbances are of significant importance. Root causes from outage propagation of the blackouts, and key lessons from recent

events can be leveraged to further enhance the Standards and avoid mistakes of others. Importance of advanced applications of synchrophasor technology, for better detection, alarming, and mitigation of oscillations and cascading outages are key.

- The need for timing precision, new protection, automation, and operational solutions have become vital. Advanced simulation tools are needed to thoroughly simulate solutions for deployment for dynamic operating conditions. New solutions including topologies, algorithms, and deployment strategies are needed.

An evolving environment requires a transformed grid. The need for new robust and well tested solutions never been more acute. Advancements in Artificial Intelligence have helped in growth and in acceptance of digital platforms, and more efficient energy-management. When properly implemented, advanced portfolio of sensors, timing technologies, services and solutions enable us to build more reliable systems supporting today's needs and future autonomous grids.

This lecture will cover energy and technology transformation, practical examples of dynamic operating system encounters in hybrid systems, cascading and oscillatory stability management tools and practices, root causes from outage propagation of major blackouts and related lessons, and solutions to manage operational aspects of the grid system, system restoration, assets over life cycle, security, and the new skillsets required. Grid Resiliency identifiers from Reliability, mitigation and prevention of cascading failures while operating the modern-day grid with practical examples will be shared.



Speaker Profile: Vahid Madani, Ph.D., Fellow IEEE – is Executive Engineer at GridTology, LLC., an international advising corporation and training institution in advanced power systems applications, grid modernization, and deployment of emerging technology in generation, transmission, and distribution.

Madani's experience spans across system planning, operation, protection and control engineering and is recognized for his expert support in grid modernization and deployment of emerging technology including Wide-area systems and RAS (Remedial Action Scheme).

Dr. Madani has held many roles including Chair of the IEEE PES Fellows Committee, and Chair of the PES Awards and Recognition. Within the industry, his leadership roles include Regional Reliability at the Western Electricity, advisor to the National Science Foundation for smart grid Research Grants, Chair of the Standards for Synchrophasor systems at NERC, advisor to the U.S. Department of Energy (DOE) on wide-area systems and on portfolio of energy programs, and is a member of National Executive Committee for Positioning, Navigation, and Timing (PNT) a US Space-Based Program.

Madani's publications and transactions are frequently cited. He has co-authored text books and reference handbooks, is a Fellow of IEEE, IEEE Distinguished Lecturer, a board-certified Electrical Engineer in California, and holds multiple US and International patents.

5) Webinar: **Why is Edge Compute leading to the convergence of the Industrial Internet of things and 5G? Security, Privacy, Control, Accountability**

Tuesday 21 Sep 2021, 5:00pm to 6:00pm CST

Abstract: Mobile computing, specifically cell phones, has changed the way we communicate and define relationships between devices, data and users. We are seeing the restructuring of the digital economy as relationships between businesses, users, devices and data blend together on the edge to improve operations and service delivery. This presentation explores the issues stopping these two IoT industry standards from becoming one: (Industrial Internet of Things Consortium and the ETSI (5G with MEC)). Both are focused on using edge computing to improve customer service and operations through the management of data, users and devices. Relationships between businesses, users, and devices that define edge computation. A mesh of interaction defined by relationships, operations and data will exist between users and devices based on common needs. Ubiquitous connectivity is a foundational technology enabling device and data sharing. Four foundation principles are required for relationships: security, privacy, control and accountability. Ownership and relationships are defined by these principles.



Speaker Profile: Alfred Strauch is President of Smart Talk Beacon Solutions Ltd. Alfred graduated from the University of Regina with a bachelor of Art and Sciences. He has been involved in the computer industry for more than 25 years (including 15 years in the surveillance industry). Smart Talk Beacon Solutions Ltd. was started 5 years ago to develop a monitoring and support solution for surveillance cameras. Experience and 3 product versions of our product lead to the patenting and development of cutting edge “No Trust Security” architecture and protocol to secure, monitor, operate, manage and support IoT devices.



Speaker Profile: Steven Carbno is Technology Architect and Senior Programmer at Smart Talk Beacon Solutions Ltd. He did BSc from University of Regina and has 20 yrs of programming experience. He is an architect and developer of “No Trust Security” architecture and protocol to secure, monitor, operate, manage and support IoT devices.

6) Women in Engineering Region 7 (Canada) Networking Event

Wednesday 28 Apr 2021, 4:30pm to 5:30pm CST

In celebration of the WIE International Leadership Conference, WIE members from across Canada come together for a virtual networking event. There was a panel discussion on the topic of *Transitions* - from an undergraduate program to grad school, academia to industry, and starting one's career after graduation. There was also time for Q and A, and a chance to get to know fellow engineers from other cities in Canada.

This event was jointly hosted with the Winnipeg Section WIE Affinity Group, the Ottawa Section WIE Affinity Group, and the Montreal Section WIE Affinity Group.

7) IEEE CPSCoM 2021 Computer Society Young Professionals Meetup

Tuesday 7 Dec 2021, 10:00pm to 12:00am CST

In IEEE CPSCoM-2021 conference, IEEE CS SYP aims to meet with the YP members/graduate student members to increase their awareness about the YP activities/initiatives/opportunities driven by IEEE CS. The IEEE CS SYP also aims to introduce volunteering opportunities/initiatives in local CS units (like CS chapters) to YP members. The 2022 IEEE CS President Dr. Bill Gropp will make the opening speech of this YP meetup.

This event was jointly hosted with the IEEE Computer Society (CS) Student and Young Professionals (SYP)