**IEEE Computational Intelligence Society (CIS) Intelligent Systems Applications TC (ISATC)**

**Task Force: Intelligent Systems for Cybersecurity of IoT**

**Purpose and Scope:**

The goals of this task force under ISATC are: (1) to integrate frontier computational intelligence technologies to secure intelligent internet of things (IoT) from the viewpoints of software and hardware systems; (2) to provide a platform for university faculty, students and industrial researchers to communicate and discuss intelligent systems for cybersecurity projects.

In recent years, new computational intelligence and machine learning frameworks have been developed as useful techniques to address many important security issues in both software and hardware of IoT systems. For example, modern electric power grid operation and safety issues need the special attention and involvement of people with expertise in neural networks, fuzzy networks and evolutionary computation as well as physical hardware systems. Grid modernization represents a comprehensive effort to shape the future of our nation’s grid and solve the challenges of ensuring that the grid is resilient and secure to withstand growing cybersecurity and climate challenges. A number of new learning and optimization methods, e.g., deep neural network and deep reinforcement learning, are the new trends to address the critical software and hardware security challenges in the intelligent IoT systems.

This ISATC task force will provide a unique platform for researchers from different societies, including computational intelligence, machine learning, power and energy, cybersecurity, communications, hardware systems and among others, to share their research experience towards a smart IoT system. It will also enhance the discussion among different communities to explore more challenge cross-discipline topics along this direction.

We are particularly interested in, but not limited to the following topics:

* New machine learning methods (e.g., deep learning and deep reinforcement learning) for cybersecurity in intelligent IoT systems
* New computational intelligence methods for industrial system applications (e.g., encryption, authentication and access control)
* Cyber physical system and IoT hardware testbed and real-time simulation based on computational intelligence
* Cyber physical system and IoT security, and vulnerability analysis based on computational intelligence
* Cybersecurity in big data applications of intelligent IoT systems
* Cybersecurity in power system dynamic stability and control based on computational intelligence
* Cybersecurity in smart grid using new game theoretic methods
* Cybersecurity in vulnerability assessment of intelligent power systems

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**TF Vice Chairs:**

Harith Al-Sahaf, Victoria University Of Wellington, Wellington, New Zealand

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**Zhen Ni**, South Dakota State University, SD, USA

Dr. Ni is currently an Assistant Professor in Department of Electrical Engineering and Computer Science (EECS), South Dakota State University (SDSU), Brookings, SD. He received his Ph.D. degree from the Department of Electrical, Computer and Biomedical Engineering, University of Rhode Island (URI), Kingston, RI, in 2015. He received B.S in Department of Control Science and Engineering (currently renamed as College of Automation), Huazhong University of Science and Technology (HUST), Wuhan, China, in 2010.

His research mainly includes Smart Grid, Computational Intelligence, Machine Learning, Adaptive Control, and Cyber-Physical Systems. He is very active in professional societies, including IEEE Computational Intelligence Society (CIS). For instance, he served as the General Chair for *IEEE CIS winter school on Computational Intelligence for Big Data, Washington D.C.* (2016), and Technical Program Co-Chair for *IEEE International Conference on Cyber, Physical, and Social Computing (CPSCom),* Halifax, Canada (2018). He also organized a special issue of Cyber-Physical Power Systems on *IET Cyber Physical Systems: Theory & Applications (2017-2018)*. He is an Associate Editor for *IEEE Computational Intelligence Magazine* (IF: 6.343) from 2018.

He received the Chinese Government Award for Outstanding Students Abroad by Chinese government (2014), Second Prize of Graduate Student Poster Contest in IEEE Power and Energy Society General Meeting (2015), Enhancement of Graduate Research Award (EGRA) by URI (2014), Travel Award by IEEE SSCI-Doctoral Consortium (2014), National Encouragement Scholarship by Ministry of Education in China (2007), and all Outstanding Academic Students awards in HUST (2006-2010).

**Harith Al-Sahaf**, Victoria University Of Wellington, Wellington, New Zealand

Harith Al-Sahaf received the B.Sc. degree in computer science from Baghdad University, Baghdad, Iraq, in 2005. He joined the Victoria University of Wellington (VUW), Wellington, New Zealand in July 2007 where he received his MCompSc and PhD degrees in Computer Science in 2010 and 2017, respectively. In October 2016, he has joind the school of Enginering and Computer Science, VUW as a Post-doctroial Resrearch Fellow and as a full-time lecturer since September 2018.

Since 2010, he has been with the Evolutionary Computation Research Group, VUW. He has published over 24 academic papers in fully refereed international journals and conferences including IEEE Transactions on Evolutionary Computation and Evolutionary Computation Journal. His current research interests include evolutionary computation, particularly genetic programming, computer vision, pattern recognition, evolutionary cybersecurity, machine learning, feature manipulation including feature detection, selection, extraction and construction, transfer learning, domain adaptation, one-shot learning, and image understanding.

Dr Al-Sahaf has been serving as a Reviewer for top international journals including IEEE Transactions on Evolutionary Computation, the IEEE Transactions on Cybernetics, the Evolutionary Computation Journal, and the IEEE Transactions on Emegent Topics in Ccomputational Intelligence. He is a member of the IEEE Computational Intelligence Society, the IEEE CIS Task Force on Evolutionary Computer Vision and Image Processing and the IEEE CIS Task Force on Evolutionary Computation for Feature Selection and Construction. He has been serving as Program Committee Member for over 20 international conferences.

**Professor G. Kumar Venayagamoorthy,** Duke Energy Distinguished Professor of Electrical and Computer Engineering

Professor G. Kumar Venayagamoorthy received a B.Eng. (Honors) degree in Electrical and Electronic Engineering from the Abubakar Tafawa Balewa University (Nigeria) in 1994. He then worked for Square One Comnet (Lesotho) from 1994 to 1995. He joined the University of Natal (South Africa) in October 1995 where he received his M.Sc.Eng. and Ph.D. degrees in Electrical Engineering in April 1999 and Feb. 2002, respectively. Professor Venayagamoorthy was on the academic staff at the Durban Institute of Technology (South Africa) as a full-time Lecturer (March 1996 to April 2001) and Senior Lecturer (May 2001 to April 2002). He had visiting research scholar appointments with Texas Tech University in 1999, University of Missouri-Rolla in 2000/2001, and ABB Corporate Research Center (Sweden) in 2007. Prior to joining Clemson University as the Duke Energy Distinguished Professor of Electrical and Computer Engineering he was a Professor of Electrical and Computer Engineering at Missouri University of Science and Technology where he held the ranks of an Assistant Professor (tenure-track, 2002-2006), Associate Professor (tenured, 2006-2011) and Professor (2011). He is the Founder and Director of the Real-Time Power and Intelligent Systems Laboratory (http://rtpis.org). Professor Venayagamoorthy is a Fellow of the Institution of Engineering and Technology (IET), UK and the South African Institute of Electrical Engineers (SAIEE). He is a Senior Member of the IEEE and the International Neural Network Society, and a Member of the American Society for Engineering Education. He is member of Board of Governors of INNS (2009-2011), and re-elected for a second three year term.