UI-ASSIST WEBINAR: A comparative study of UI-ASSIST Developed Volt-Var Control Algorithms on AVISTA's test system

Thursday, October 27, 9:00 am PT (9:30 pm IST)

U.S. INDIA COLLABORATIVE FOR SMART DISTRIBUTION SYSTEM WITH STORAGE

Presenters: Mike Diedesch (AVISTA, US); Rabab Haider/Vineet Jagadeesan (MIT, US); Subir Majumder/Anurag Srivastava (WVU, US); Ben Mccornack/Sanjeev Pannala (WSU, US)

Utilities witnessing a high penetration of distributed energy resources (DERs) installations in distribution systems and at the edge of residential, commercial, and industrial customers. High integration of DERs poses network operational challenges and electric utilities are looking for additional value from DER's alternate services including VAR support, loss minimization, peak demand reduction. While achieving these services, the distribution network may experience voltage violations in lengthy feeders at the far-end customer nodes. To overcome these issues, MIT, WVU, and WSU developed volt-var control (VVC) schemes such as distributed, centralized, and local algorithms. All the VVC schemes have been validated on the same AVISTA system under defined case scenarios to provide a common benchmark for comparison. This is the first attempt to transform research-driven technology into possibly a field-adaptable approach from the UI-ASSIST project. This talk covers insights into each VVC scheme's benefits, implementation steps, and resource dependencies, looking at AVISTA system requirements and analyzing possible worst scenarios in the future.

Please join our monthly UI-ASSIST webinar on October 27, 9am – 10 am PST.

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Presenter bios are on the following page.

Presenter Bios

Mike Diedesch is the Avista Grid Innovation Lab Manager. He received his B.S. in Electrical Engineering from Washington State University in 2008 and is a registered Professional Engineer in Washington. Since joining Avista Utilities in Spokane, WA, he has worked in various engineering roles including Generation Controls, SCADA, System Protection, Metering, and Smart Cities Lead.

Rabab Haider is a PhD Candidate at MIT, Department of Mechanical Engineering. She is a Chevron-MIT Energy Fellow, and past recipient of the MathWorks-MIT Mechanical Engineering Fellowship, and Raj V Tahil Fellowship Fund Award. Her research interests are in power systems operation under deep decarbonization, including distributed optimization, design of future electricity markets, and physics-informed ML for power systems.

Vineet is a 4th year PhD candidate in the Computational Science & Engineering program at MIT. He conducts research in the Active-Adaptive Control Lab in the Mechanical Engineering department - applying tools from optimization methods, control theory, and machine learning to model smart grids & transportation networks. His current research is focused on electricity market design and power grid modeling to integrate more renewables and distributed energy resources, at both distribution and transmission levels.

Subir Majumder received the Ph.D. degree under a Cotutelle/Joint Agreement between Indian Institute of Technology Bombay, India and University of Wollongong, Australia in 2020. Currently, he is working as an Engineering Scientist at the West Virginia University, Morgantown, WV, USA. His research interests include power systems modeling, operations, economics, and the smart grid.

Dr. Anurag K. Srivastava is an associate professor of electric power engineering at Washington State University and the director of the Smart Grid Demonstration and Research Investigation Lab (SGDRIL) within the Energy System Innovation Center (ESIC) and holds a joint appointment as a Senior Scientist with the Pacific Northwest National Lab (PNNL). His research interest includes data-driven algorithms for power system operation and control including resiliency analysis. He is vice-chair of the IEEE Power & Energy Society's (PES) of power system operation SC, vice-chair of tools for power grid resilience TF and member of CIGRE C4.47/ C2.25 Resilience WG. He is author of more than 300 technical publications including a book on power system security and four patents.

Ben Mccornack graduated from WSU in 2019 with a bachelors degree in Electrical Engineering and promptly got a job working at Schweitzer Engineering Lab as an automation engineer in the Special Protection Systems group. Ben's role was to develop the power system control code that maintained system reliability through automatic generation control (AGC), Voltage control schemes (VCS), and various Contingency based Load Shedding algorithms (CLS). He has since left SEL in pursuit of his Phd in electrical engineering at Washington State University.

Sanjeev Pannala is working as an Assistant Research Professor at Energy System Innovation Center, Washington State University Pullman. His research interests include distribution system resiliency, data-driven algorithms, ADMS, Integration of Microgrids and DERs, and Real-time studies. He worked on the India-UK HEAPD project from October 2014-January 2018 to earn his Ph.D. at the Indian Institute of Technology Roorkee (IITR), India.