TEXAS A&M UNIVERSITY
Department of Electrical & Computer Engineering

TRANSFORMING ENGINEERING EDUCATION

# ENERGY & POWER SEMINAR

## Area Sparsity in Large-Scale Electric Grids and its Impact on Power System Sparse Matrix Statistics


### Abstract

Real-world power grids are inherently sparse. Sparse matrix statistics can provide insight into the structural characteristics of power grids. These statistics can be used to make synthetic power grids topologically similar to real-world grids. Synthetic grids are publicly available and play a vital role in studying power grids and developing new algorithms among researchers, while actual grid information is critical energy/electricity infrastructure information. The closer the topological similarities between synthetic and actual grids, the better the research results. Building on previous work, where existing synthetic grids are compared with real-world grids in terms of area sparsity, in this work, the synthetic networks are modified to have lower inter-area sparsity. Then the sparse matrix statistics of the original and modified synthetic grids are compared against real-world networks. The results show improvements in sparse matrix statistics as a reduction in inter-area sparsity makes the synthetic power grids topologically similar to power grids in the real world.



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**Friday, November 10**
**11:30 am - 12:20 pm**
**244 ZACH**

### Biography

Sanjana Kunkolienkar earned her electrical engineering bachelor's degree from Mumbai University in 2018. Now at Texas A&M University for her Ph.D., she studies power systems, working on making large-scale synthetic power grids topologically similar to the real ones. Her research involves understanding the topology and characteristics of actual electric grids.


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