



Dynamics of Multilayer Complex Infrastructure Networks

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Changing the World's Energy Future

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Project Summary

Our research effort models critical infrastructure systems as complex and interdependent networks, allowing for dynamic analysis of the resilience and robustness of these connected systems.

Innovative Aspects

- Synthetic generation of infrastructure networks with Machine Learning
- Graph representations that capture maximum dynamics of complex, infrastructure networks
- Novel analytic techniques to measure resilience and robustness of interconnected networks

National Significance

- Quantitative assessments of risks and resilience will enable detection and prioritization of high consequence cross-sector interdependencies
- Emergency planners and critical infrastructure owners/operators will have enhanced capabilities for resiliency mitigations and recovery plans in anticipation of disastrous events

Research Status

- Analysis of graph methodologies (e.g. percolation, epidemics) for measuring infrastructure resilience
- Incorporation of *Functional Dependency Profiles Graph* into analysis framework
- Development of real and synthetic interdependency data sets

