

Anomaly Detection in Multilayer Networks

Challenge:

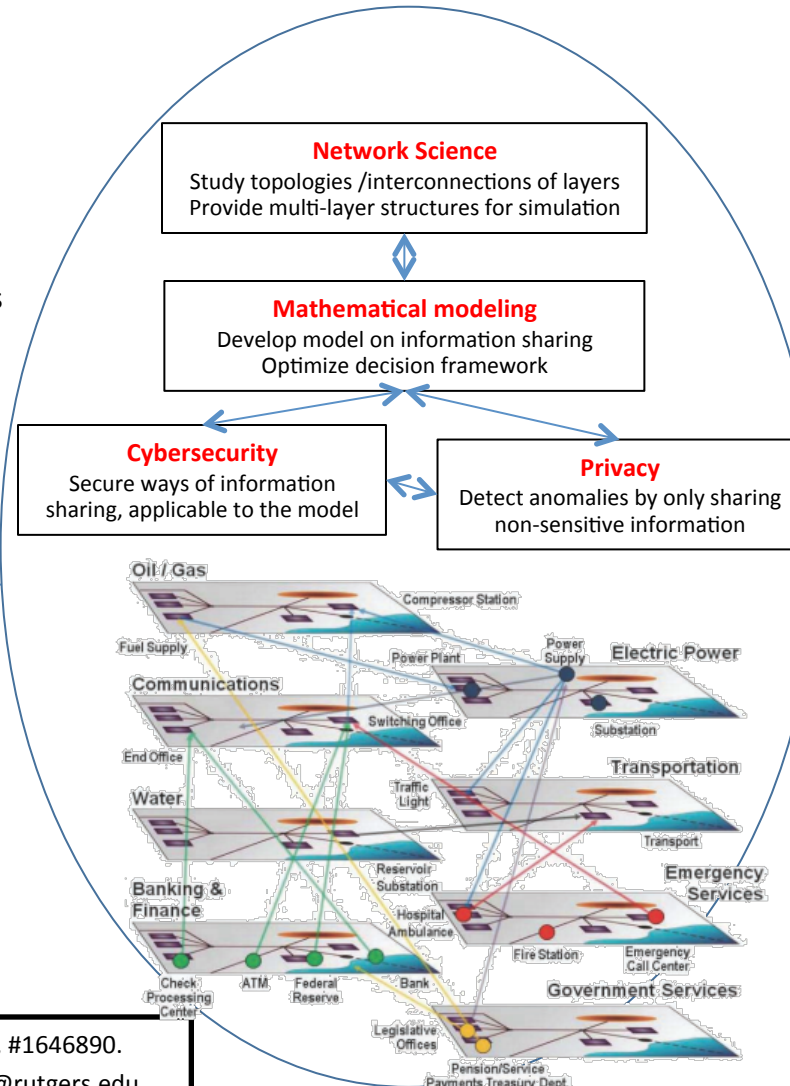
Early detection of anomalies in an integrated system of heterogeneous inter-dependent networks

- The Internet, the power grid, financial, transportation, and other networks, are mutually dependent and synergistic effects may lead to cascading phenomena.
- Communication and traffic across networks may differ in nature/capacity.

Solution:

- Use distributed methods for anomaly detection, sharing non-sensitive information across and within networks.
- Develop mathematical models to understand and optimize the efficiency and accuracy of the detection methods.

EAGER Collaborative Project. Awards: #1646856, #1646890.
PI: Rebecca N. Wright (Rutgers), rebecca.wright@rutgers.edu
co-PI: Lazaros K. Gallos (Rutgers)
PI: Nina H. Fefferman (University of Tennessee)



http://www.empcommission.org/docs/A2473-EMP_Commission-7MB.pdf



RUTGERS



Scientific Impact:

- The project offers the ability to identify coordinated attacks on heterogeneous systems and understand how damage spreads between layers
- Sharing of information within and among layers improves detection efforts, all while preserving privacy
- The project lays the path for extending single-network security algorithms to multi-layer networks.

Broader Impact:

- The unified view of many cyber and physical critical systems can increase the protection of national infrastructure
- The project introduces algorithms and models with the potential to evolve into applied protocols
- The project introduces undergraduate CS students to cybersecurity and network science research