Cyber resilience and cyber security are complementary areas of study. While cyber security attempts to keep attackers out of a system, cyber resilience asks “What happens when those adversaries do get in?” Resilience is important to making sure that the impact of an attack on a system is minimized, and that the system is able to return to a normal state as quickly as possible. The ability to measure the level of resilience of a particular cybernetwork over time or to compare the resilience of multiple networks is a valuable tool for cyber resilience researchers, and it is a task that requires metrics. Currently, there are no universally-accepted metrics for cyber resilience.

The goal of this project was to create an application that would use graph analysis and metrics for network efficiency and resilience to quantify network topologies. Metrics previously defined by Ulanowicz et al. for carbon flow through ecological networks were adapted in order to better represent cyber networks, including utilizing link capacity and cost to constrain flow across the network, and integrating a way to explore the temporal dynamics of cyber networks.

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