

Lewis University
STEM Undergraduate Research Experience (S.U.R.E.) 2019
Faculty Mentor – Project Application

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Research Project Title: Determining Functional Roles in Networks using Topological Properties

This project involves analyzing network data such as social networks or connectomes by examining their topological properties. The goal is to develop a method to identify the specific functions that are served by particular nodes of the network. For example, in a connectome, one could find neurons that serve sensory roles in the nervous system. In a social network, one could identify the people serving important social roles within a community. The idea to derive the method is based on prior work on identifying the functional role of neurons in the C.elegans worm connectome, which used algorithms from the field of information retrieval along with machine learning techniques. This project would use these ideas to develop a generalizable method of network analysis and apply it to various domains. It would involve extensive statistical analysis, programming in Python, applying machine learning techniques, and experimentation with different datasets.