1135-00-1362 **Tegan H Emerson*** (tegan.emerson@nrl.navy.mil). *Persistence Images for Differentiating Class Based Network Structures.*

The human brain, and many other complex structures, can be studied using networks. One can define the nodes and edges of the graph in a multitude of ways. In functional networks modeling mental processing structures the nodes correspond to different brain regions and the edges between them are weighted by a measure of similarity of time series measured at the brain regions. These networks can then be studied using ideas from computational topology: a set of algorithmic methods that characterize topological invariants such as connectedness, loops, or holes in high-dimensional data structures. These methods go beyond pairwise connections and enable one to understand global low-dimensional structures in networks, which is difficult for existing methods. In particular, persistent homology, a method that consists of a mathematical formalism to explore the persistence of such structures, has led to promising results in many applications including dynamical systems, neuronal networks, and others. Persistence Images are a stable vector representation of homological features identified from persistent homology. Persistence images can detect differences between networks associated to different classes more strongly than other representations of homological information in many settings. (Received September 21, 2017)