1128-55-294 **Cliff A Joslyn*** (cliff.joslyn@pnnl.gov), 1100 Dexter Ave # 400, Seattle, WA 98109.

Description Sheaves for Topological Information Fusion.

Our research group has been exploring novel approaches in computational topology with application to information fusion and analysis. Our approach aims to bring methods in computational and applied toplogy to bear specifically on structured data analytics, where input sources take the form of multirelational or graphical data (as opposed to point clouds). In this context we focus on complex graph structures, specifically abstract simplicial complexes and hypergraphs (usually undirected, sometimes directed). This perspective supports a topological interpretation of hypergraphs, for example for measuring local homology; and dually network science interpretations of topological complexes. On this foundation, we then develop simplicial sheaves equipped with uncertainty quantification consistency structures to measure sensor error and sensitivity by identifying a filtration of specifically local sections. Future work aims at interpreting "data loops" through cohomology of these description sheaves, and moves towards predictive modeling with cosheaves and dual sheaves. We will demonstrate with initial applications in geolocation tracking. (Received February 28, 2017)