UNIVERSITY AT ALBANY
State University of New York

College of Arts and Sciences
Department of Mathematics and Statistics

Applied Topology in Albany (ATiA) Seminar

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Asymmetrically Weighted Dowker Persistence and Applications in Dynamical Systems

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Abstract. By their nature it is difficult to differentiate chaotic dynamical systems through measurement. In recent years, work has begun on using methods of Topological Data Analysis (TDA) to qualitatively type dynamical data by approximating the topology of the underlying attracting set. However, a prominent feature of dynamical systems, periodic behavior, is not fully captured in traditional TDA on these data. In this talk we will discuss a Dowker Persistence based framework which incorporates temporal information to better represent high dimensional time series data. I will begin with an introduction to Dowker persistence on asymmetrically weighted networks, build an understanding of its relationship to other kinds of network (graph) structure (paths, cycles, and dominating sets), before relating it to the framework mentioned above.