1128-55-321   **Courtney M Thatcher*** (`cthatcher@pugetsound.edu`). *Comparing Directed and Weighted Graphs.*

Map construction algorithms exist for creating road maps from GPS data, but to assess the quality of these maps we need to be able to meaningfully compare different constructed road maps from the same region. Different approaches exist, but most model the road maps as undirected embedded planar graphs. In this talk we discuss an approach that compares more realistic models of road maps, ones that involve directed roads as well as weighted roads. We begin with some background, and then provide a method for comparing the same graph with two different annotations (such as weight functions and/or directions on the edges). The method broadly involves defining different filtrations that depend on the additional information on the graph, and then with persistent homology, determine the birth times of a set of cycles of interest, which can then be compared to determine the distance between the two different annotations. We then discuss how to extend these techniques to annotated graphs that are similar. (Received February 28, 2017)