

1125-VU-1298 **Irma E. Stevens*** (istevens@uga.edu), 110 Carlton St., University of Georgia, Athens, GA
30602. *Topological Data Analysis of Students' Responses to MAA Surveys on College Calculus.*

Topological data analysis (TDA) is a powerful method that can be less sensitive to noise than its competitors (e.g., PCA or HCA) and can handle large data sets. The method has been used to study a broad range of data sets taken from FDG-PET scans to fingerprints. This study focuses on the data set from the MAA national study of college calculus starting in 2012. A subset of the data was chosen in order to focus on the 797 participants in the study who completed both the pre- and post-course Likert scale surveys which included topics such as high school preparation for calculus, attitudes towards mathematics, and students' thoughts on the structure and instruction of their calculus course. The data was explored in three different ways: pre-/post-variables, two variables and a normalized frequency variable, and various variables of interest based on previously reported statistical analysis of the data set. Using the Rips method of creating simplicial complexes on a combination of the aforementioned variables, the persistent homologies of up to the second homology group were constructed using persistence diagrams. I will discuss the persistence diagrams and interpretations of them based on the 3D plots of combinations of three variables. (Received September 16, 2016)