

1135-55-1736      **Robert Short\*** ([rss212@lehigh.edu](mailto:rss212@lehigh.edu)). *Relative Topological Complexity of a Pair of Spheres.*

In the early 2000s, Michael Farber introduced the notion of Topological Complexity as an invariant addressing the least number of rules needed to perform motion planning for robots in a continuous way. This sparked interest in topological robotics, a field of applied algebraic topology which draws inspiration from problems in robotics to ask interesting topological questions. Much of the research in this field introduces different variants on Topological Complexity inspired by addressing different desirable properties of various robots.

In this talk, we introduce a new variant called the Relative Topological Complexity of a Pair. We draw inspiration from the problem of maneuvering a robot to a specified set of known goal configurations. As spheres arise naturally in both configuration spaces of robots and algebraic topology, we present how to calculate the values for this invariant for spheres as a simple example, and we discuss other possible applications of the result. (Received September 24, 2017)