Parametrized topological complexities of maps

Petar Pavešić[1],
joint work with Urban Ogrinec[2]

[1] *University of Ljubljana, Faculty of Mathematics and Physics, and Institute of Mathematics, Physics and Mechanics, Ljubljana*
[2] *Institute of Mathematics, Physics and Mechanics, Ljubljana*

A manipulation plan for a robotic device can be viewed as a section of certain projection associated to the forward kinematic map from the configuration space of a robot to its work space. As it is in general impossible to find a manipulation plan depending continuously on the input data, one defines the topological complexity of a manipulation problem as the minimal number of continuous partial sections needed to cover all possible instances of input data. There are several variants of this concept, developed by Pavešić, Murillo and Wu, Scott and other authors, cf. [1]. In this talk we will discuss a parametrized version of topological complexity of a map which allows a treatment of the manipulation planning problem under varying conditions.

[1] P. Pavešić. *Topological complexity of a map.* In: Topology and AI, Michael Farber and Jesús Gonzáled (eds.), EMS Series in Industrial and Applied Mathematics 4 (EMS Press, Berlin, 2024), pp. 335-362.