

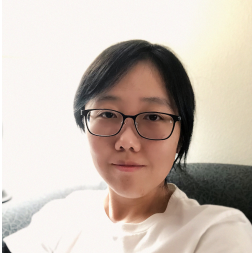


Mathematics & Statistics Colloquium

Friday, January 29, 2021, 4:15pm-5:15pm

Zoom Meeting ID: 941 6389 5998

Password (if prompted): 371814



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Multi-persistent Homology of Restricted Configuration Spaces of Metric Graphs

Abstract. Multi-persistence modules come up naturally in the area of topological robotics. For a finite connected metric graph X , we identify X with its geometric realization, which is a metric space via the path metric. The n -th restricted configuration space of a metric space X with restraint parameter $\mathbf{r} = (r_{ij})_{i < j}$ (where $r_{ij} > 0$ for all $1 \leq i < j \leq n$) is $X_{\mathbf{r}}^n := \{(x_1, \dots, x_n) \in X^n \mid d(x_i, x_j) \geq r_{ij}\}$. If $r_{ij} = 2a$ for all i, j then this is also called the configuration space of thick particles or hard disks (of radius a). As a continuation of the previous work by James Dover and Murad Özaydın, we seek to understand how the topology of $X_{\mathbf{r}}^n$ varies with n , \mathbf{r} , and the edge lengths of X , as measured by the multi-persistent homology of $X_{\mathbf{r}}^n$.

Biographical Sketch. Wenwen Li is a graduate student of University of Oklahoma, working under the guidance of Dr. Murad Özaydın. Her research interests lie in the area of Topological Data Analysis.