



Topology Seminar at Texas State

Speaker: Dr. Anton Dochtermann

Title: Hom complexes, reconfiguration, and homotopy
for digraphs

When: Friday, Feb. 11, 11:00 a.m.– 11:50 a.m.

Where: Online. Zoom info at bottom of page.

Abstract

The study of graph colorings (and more general homomorphisms) has been an active area of research for many years, with numerous applications and various tools brought to bear. Topological methods were introduced to the field via Lovász's neighborhood complex, and further extended by Babson and Kozlov who introduced a 'space of homomorphisms' between two graphs. In joint work with Anurag Singh we initiate the detailed study of such 'Hom complexes' for directed graphs (digraphs), which have applications in the study of graded posets and resolutions of monomial ideals. We relate the topological properties of Hom complexes to various digraph operations and describe how the topology of $\text{Hom}(T, G)$ for various T can be used to study a digraph G . Our complexes also provide a natural notion of 'reconfiguration' in this setting, where one is interested in sampling from the space of digraph homomorphisms via walks in the 1-skeleton. Finally we use paths in the internal hom objects of directed graphs to define various notions of homotopy, and discuss connections to the topology of Hom complexes

Zoom Information

Meeting URL: [Click here.](#)

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