Department of Mathematics and Statistics Colloquium

Interval Orders, Semiorders, and Ascent Sequences

Job Candidate

Abstract: An interval order is a type of comparison relationship based on a finite collection of closed, bounded intervals of the real line. We say that $[a, b]$ is less than $[c, d]$ in this ordering provided that b < c. In other words, the first interval lies completely to the left of the second interval. Although they were first introduced in the early 20th century, interval orders found a prominent place in the study of partially ordered sets in the 1970s, which Fishburn provided an elegant characterization of their structure and applications in computer scheduling and the social sciences were recognized. A semiorder is an interval order in which all the intervals have the same length. The number of semiorders with n intervals has been known since the 1950s, but the number of interval orders with n intervals was only completed in the last 10 years, when Bousquet-Mélou et al. completed an enumeration of them. They did this by finding a bijection between interval orders and a special class of sequences of nonnegative integers called ascent sequences. Recently, Stephen J. Young and I have built upon the work of Bousquet-Mélou et al. to better understand the relationship between semiorders and ascent sequences. In doing so, we were able to enumerate semiorders based on their dimension, a commonly-studied property of partially ordered sets. In this talk, I will give an overview of this work, beginning with all of the necessary background and motivation, proceeding to describe the key insights from the work of Bousquet-Mélou and her collaborators, and concluding with some of the particularly interesting aspects of our recent work.

Wednesday, January 24 at 3:50 in Roop 103

Refreshments at 3:30