

MSCS DEPARTMENT

RESEARCH SEMINAR

Computing tiling properties of polyforms

PROFESSOR CRAIG KAPLAN: UNIVERSITY OF WATERLOO

Polyforms—shapes constructed by gluing together copies of cells in an underlying grid—are a convenient experimental tool with which to probe problems in tiling theory. Unlike shapes more generally, they can be enumerated exhaustively, and are amenable to analysis using discrete computation. Furthermore, polyforms appear to be quite expressive in terms of the range of tiling-theoretic behaviours they can exhibit. I discuss the computation of isohedral numbers and Heesch numbers, both of which are connected to a variety of unsolved problems in tiling theory, and the connection of these problems to the discovery in 2023 of the world's first aperiodic monotiles.

This seminar is geared toward math and computer science students, but all are welcome to attend!

Thursday, October 10th | 11:20am | RNS 203



Craig Kaplan is a Professor in the School of Computer Science at the University of Waterloo. His research focuses on applications of computer science and math to art and design, incorporating perspectives from geometry, computation, graph theory, perceptual psychology, and more. In early 2023, he was one of the discoverers of the first known aperiodic monotile, which resolved a longstanding open problem in geometry and was recognized in venues including the New York Times, Scientific American, and Time Magazine.