

Department Colloquium

Speaker: Danny Rorabaugh, Queen's University

Date: Friday, October 23

Time: 2:30 p.m.

Place: Jeffery 234

Title: Zimin Words and Homomorphism Densities

Abstract: Word W is said to *encounter* word V provided there is a homomorphism ϕ mapping letters to non-empty words so that $\phi(V)$ is a substring of W . For example, taking ϕ such that $\phi(Z) = C$, $\phi(i) = a$, $\phi(n) = n$ and $\phi(r) = di$, we see that "Canadian" encounters "Zimin" since $Canadi = \phi(Zimin)$. The density of V in W , $\delta(V, W)$, is the proportion of substrings of W that are homomorphic images of V . So the density of "Zimin" in "Canadian" is $6/\binom{8+1}{2}$.

We begin this talk with the significance of Zimin words in the study of word pattern avoidance, then we cover several asymptotic results involving minimum densities in words and expected densities in random words. This is joint work with Joshua Cooper.