

RYERSON UNIVERSITY
DEPARTMENT OF MATHEMATICS
GRAPHS AT RYERSON (G@R) SEMINAR

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Date: Wednesday, April 17, 2019

Time: 10 am

Location: ENG-288

**Average Case - Worst Case Tradeoffs for
Evacuating 2 Robots from the Disk in the
Face-to-Face Model**

Abstract:

The problem of evacuating two robots from the disk in the face-to-face model was first introduced by Czyzowicz et al. (DISC 2014), and extensively studied (along with many variations) ever since with respect to worst case analysis.

We initiate the study of the same problem with respect to average case analysis, which is also equivalent to designing randomized algorithms for the problem.

Motivated by the average and worst case performance of existing algorithms, we introduce constrained optimization problem EVAC^w , in which one is trying to minimize the average case cost of the evacuation algorithm given that the worst case cost does not exceed w . Our main contribution is the design and analysis of families of new evacuation parameterized algorithms which can solve EVAC^w , for any fixed value of w .

Notably, the worst case analysis of the problem, since its introduction, has been relying on technical numerical, computer-assisted, calculations, following tedious robots trajectories' analysis. Part of our contribution is a simple systematic procedure, which, given *any evacuation algorithm*, can derive its worst and average case performance in a clean and unified way.

This is joint work with H. Chuangpishit and P. Sharma

ALL FACULTY, STAFF, STUDENTS AND GUESTS ARE WELCOME TO ATTEND