

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

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Date: Monday, September 25, 2017

Time: 11am

Location: ENG 210

**Rendezvous on a line by location-aware
robots despite the presence of byzantine
robots**

Abstract:

A set of mobile robots is placed at points of an infinite line. The robots are equipped with GPS devices and they may communicate their positions on the line to a central authority. The collection contains an unknown subset of spies, i.e., byzantine robots, which are indistinguishable from the non-faulty ones. The set of the non-faulty robots need to rendezvous in the shortest possible time in order to perform some task, while the byzantine robots may try to delay their rendezvous for as long as possible. The problem facing a central authority is to determine trajectories for all robots so as to minimize the time until the non-faulty robots have rendezvoused. The trajectories must be determined without knowledge of which robots are faulty. Our goal is to minimize the competitive ratio between the time required to achieve the first rendezvous of the non-faulty robots and the time required for such a rendezvous to occur under the assumption that the faulty robots are known at the start. We provide a bounded competitive ratio algorithm, where the central authority is informed only of the set of initial robot positions, without knowing which ones or how many of them are faulty. When an upper bound on the number of byzantine robots is known to the central authority, we provide algorithms with better competitive ratios. In some instances we are able to show these algorithms are optimal.

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