

OPTIMIZATION SEMINAR SERIES

Speaker: Mark Thom, PhD student
Optimization Research Group

Time: Friday - Sept. 11, 2015
12:00pm — 12:50pm

Location: B543

Title:

Minimizing total sensor movement for barrier coverage by non-uniform sensors on a line (extended version of Mark's upcoming talk at ALGOSENSORS in Patras, Greece)

Abstract:

Barrier coverage is a cost effective approach to intruder detection applications. It consists of monitoring the perimeter, or barrier, of an area by placing sensors at appropriate locations on the barrier. In this talk, we consider a restricted version of the barrier coverage problem in which the area of coverage is a line segment and the sensors are points with varying detection ranges that lie in initial positions disjoint to the line segment. Sensors are moved along the line containing the line segment to their final positions in the coverage, and the distances moved by each sensor are summed, determining the cost of the coverage. The objective is to find the coverage of least cost. We sketch a proof of the NP-hardness of the restricted problem and outline a polynomial-time approximation scheme that produces barrier coverages of cost arbitrarily close to that of an optimal solution. Everyone is welcome, no prior knowledge of approximation algorithms or NP-hardness is assumed. Graduate students and senior undergraduates are encouraged to attend. Please join us in a relaxed atmosphere and meet your fellow graduate students.