



The Center for Control, Dynamical Systems, and Computation
University of California at Santa Barbara
Spring 2009 Seminar Series
Presents

Cooperative intruder detection by multiple robots with limited range

Stefano Carpin
University of California, Merced

Monday, June 15, 2009 2:00 - 3:00 PM ESB 2001

Abstract:

We consider the problem of detecting all intruders in bounded multiply connected environments by using a team of cooperative mobile robots equipped with limited range sensors. The emphasis of this research is on finding solving strategies requiring the least number of robots. The question is attacked introducing a novel graph theoretic abstraction dubbed Graph-Clear. Due to its NP-hardness, the special case of environments modeled by trees will be presented, and an optimal polynomial time algorithm will be sketched. Finally, it will be shown how Graph-Clear instances can be algorithmically extracted from robot generated occupancy grid maps, and how the framework can be extended in order to account for possibly faulty sensors whose performance can be probabilistically described.

About the Speaker:

Stefano Carpin received the “Laurea” degree and the PhD in Electrical Engineering and Computer Science from the University of Padova (Italy) in 1999 and 2003, respectively. From 2003 to 2006 he held faculty positions with the International University Bremen (Germany). Since 2007 he is with the School of Engineering of the University of California, Merced, where he established the robotics laboratory. His research interests are in the field of multi-robot systems, planning, and robot algorithms. His research has been funded by the NSF, General Motors, Microsoft Research, CITRIS, and the German Science Foundation. He is an elected executive member of the International Robocup federation for the 2007-2009 term.
