

UW CENTER FOR PATTERN ANALYSIS AND MACHINE INTELLIGENCE (CPAMI) GRADUATE SEMINAR SERIES

Global Optimal Path Planning for Mobile Robots based on Hybrid Approach
with High Diversity and Memorization

Speaker: Miao Yun-Qian (Mike)

Date: July 13, 2011

Time: 4 pm- 5 pm

Place: E5 (5128) Refreshments will be served

Abstract :

Robot path planning problem addresses how to find a collision-free path for a mobile robot from a start position to a given goal position, amidst a collection of obstacles. Efficient algorithms for solving problems of this type have important applications in areas such as mobile robotics and intelligent transportation. We present a hybrid approach to the path planning problem that combines potential field (PF) method and genetic algorithm (GA). The proposed PF and GA approach takes the strength of both potential field and genetic algorithm to find global optimal collision-free paths. In this integrated frame, the PF is designed as gradient-based searching strategy to exploit local optimal, and the GA is used to explore over the whole problem space. Different implementation strategies are examined through simulations in 2D scenarios. The conducted experiments show that global optimal path can be achieved effectively using the proposed approach with a strategy of high diversity and memorization.