

Field Robotics Center Seminar Series

Tuesday, Sept 28th, 2010 GHC 2109 11am - noon

Pizza will be served



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Mission control of autonomous vehicles based on time logic framework

Abstract

This talk presents recent research of mission control of autonomous vehicle based on time logic framework. First, an introduction to the topic of autonomous vehicles, the different control levels and the problem of mission control, is given. Then a logic control paradigm is proposed to deal with the mission control specification and solution. This approach is based on the use of linear temporal logic (LTL) formula to specify the mission objectives that can be later translated into a mission controller for solving the problem. One key advantage of this paradigm that the solution controller or planner is found automatically and can be proved to be correct by construction. Most known solutions for this problem follow a static approach, where the formula is used off-line to define completely the controller to be implemented. One the main contributions of this research was to develop a dynamic approach that can find an on-line solution and has low computational complexity. The proposed approach has many advantages: the progressive construction of the solution, the ability to deal with changeable specifications and environments, and the non-necessity of visiting the entire state space for finding the solution. Examples of mission specification and dynamic control solution are finally presented.

Speaker Bio

Dr. Bassi is an engineer, researcher, entrepreneur and consultant with a broad experience in automation and business intelligence areas. He graduated from Universidad de Chile (BSc EE, PEE and MSc EE) and University of Southern California (PhD Computer Science). He has held academic positions at the U. of Chile (Dept. Industrial Eng.), U. of Santiago (Dept. Computer Eng.) and Villanova University (Mech. Eng.) from 2008. His main research interest includes Automation, Robotics, Computational Intelligence and Business Analytics. More recently his research has been focused on autonomous systems, particularly the control of unmanned vehicles.

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