



**The Center for Control, Dynamical Systems, and Computation
University of California at Santa Barbara
Winter 2008 Seminar Series
Presents**

**Distributed Implementations of Global Temporal Logic
Motion Specifications**

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Friday, February 22, 2008 3:00-4:00pm Harold Frank Hall 1104

Abstract:

The existing approaches to motion planning and control of multi-agent mobile systems have too many limitations. First, task specifications are only given as “Go from R1 to R2 and avoid obstacles.” This is not rich enough for a large class of robotic applications, where temporal and logic statements about the reachability of regions of interest are necessary, e.g., “Always avoid R4. Visit R1 or R2 and then go to R3 and stay there for all future times. After R3 is occupied, within 10 min, start visiting R2 and R5, in this order infinitely often.” Second, most of the existing approaches (including consensus algorithms) are bottom-up, in the sense that they show that local interaction rules, inspired from natural systems or derived from first principles, induce interesting global behavior. However, the inverse problem seems more relevant to robotics: Can we automatically synthesize provably correct control and communication strategies from rich, global specifications? In this talk, I will show some preliminary results in this direction.

About the Speaker:

Calin Belta received B.S. and M.Sc. degrees in Control and Computer Science from the Technical University of Iasi, Romania, before earning a M.Sc. in Electrical Engineering from Louisiana State University, and M.Sc. and Ph.D. in Mechanical Engineering from the University of Pennsylvania. He is currently an Assistant Professor at Boston University. His research interests include analysis and control of hybrid systems, motion planning and control, and bio-molecular networks.

Calin Belta received an NSF CAREER award in 2005, a Fulbright study award in 1997, and was the Valedictorian of his class in 1995. He received the best poster award at the Int. Conf. on Systems Biology in 2004 and was a finalist for the ASME Design Engineering Technical Conference best paper award in 2002 and for the Anton Philips best student paper award at the IEEE Int. Conf. on Robotics and Automation in 2001.