

AEROSPACE & MECHANICAL ENGINEERING



**2011 COLLOQUIUM 2012
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**INFORMAL COFFEE PERIOD BEFORE THE SEMINAR IN ROOM 365 FITZPATRICK HALL
UNIVERSITY OF NOTRE DAME, NOTRE DAME, INDIANA 46556**

SPEAKER: Professor Timothy Bretl
Aerospace Engineering
University of Illinois at Urbana-Champaign
Urbana, Illinois

TOPIC: MECHANICS AND MANIPULATION
OF ELASTIC KINEMATIC CHAINS

DATE: Tuesday, November 8, 2011

TIME: 3:30 p.m.

PLACE: 138 DeBartolo Hall

ABSTRACT

Consider a flexible wire of fixed length that is held at each end by a robot arm. The curve traced by this wire can be described as the solution to an optimal control problem, with boundary conditions that vary with the position and orientation of each robot. The set of all solutions to this problem is the configuration space of the wire under quasi-static manipulation. I will show that this configuration space is a smooth manifold of finite dimension that can be parameterized by a single chart. Working in this chart --- rather than in the space of boundary conditions --- makes the problem of manipulation planning very easy to solve. I will discuss the reasons why and will consider the application of similar ideas in other contexts, for example inference of human intent based on control-theoretic models of motor function.

NOTE: *If you are interested in meeting individually with Prof. Bretl, please contact Evelyn at 631-5431*