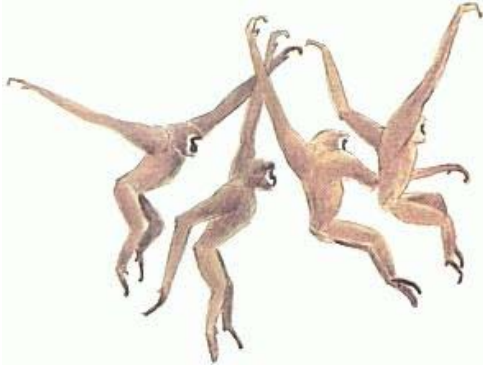


MECHANICS COLLOQUIUM



Monday, Sep 20, 2004
15:45-16:45 h.
Delft University of Technology
Mechanical Engineering
Mekelweg 2, Delft
Room J



“Some Mechanics Perspectives on Robot Locomotion”

Andy Ruina

Department of Theoretical and Applied Mechanics,
Cornell University, Ithaca, NY.

Abstract - Although the common approach to both observing and artificially generating terrestrial locomotion of animals and robots is kinematic, the approach we consider is to emphasize the mechanics. The over-riding theme is that some aspects of animal motion may be well understood by considering ways to minimize energy use and, similarly, more effective robots may be built if energy use minimization is considered in both the architecture and the actuation.

Something to think about before the talk: what muscles do you use to walk at what points in the walking cycle? Why?

Our robotic successes are similar to, and overlap with, those at Delft. Additional recent theoretical/simulation results include ideas about how to walk and brachiate (swing from branches) with (in principle) zero energy cost; like the rolling of a rigid wheel.

About the speaker - <http://tam.cornell.edu/~ruina/> Andy Ruina runs the Robotics and Human Power Lab and teaches mechanics and math classes. His main current research is the mechanics of coordination, particularly legged locomotion. He is interested in classical rigid-body dynamics especially as related to contact (collisions, friction, non-holonomic constraints). He used to work mostly on friction laws, especially in the context earthquake slip (experiments and theory). He also knows more or less about dynamical systems, bicycles, solid mechanics, and fracture. His degrees are from Engineering at Brown U (ScB 76, ScM. 78, Ph.D. 81). He was a National Science Foundation Presidential Young Investigator.

