UNIVERSITY OF MARYLAND

A SEMINAR TO DESCRIBE SIMPLIFIED MODELS OF THE SWIMMING OF A FISH SHAPED BODY UTILIZING POINT VORTEX DYNAMICS

NONHOLONOMIC CONSTRAINTS AND PASSIVE MECHANICS IN A BIOINSPIRED SWIMMING ROBOT

Thursday, April 12, 2018
3:30 p.m.
2164 Martin Hall, DeWalt Seminar Room

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ABSTRACT

The swimming of fish like animals has many desirable characteristics like high efficiency and maneuverability. This talk will describe simplified models of the swimming of a fish shaped body utilizing point vortex dynamics. These models reveal surprising connections with classical rigid body dynamics with nonholonomic constraints. These nonholonomic systems serve as a highly reduced model to describe the motion of a swimmer. Vortex dynamics models also reveal the possible role played by the passive deformations of a natural swimmer in improving its maneuverability. The talk will elucidate these concepts through theoretical, computational and experimental means.

BIO

Phanindra Tallapragada is an assistant professor in mechanical engineering at Clemson University. He has been at Clemson University since August 2013. Prior to this he was a postdoctoral fellow at the University of North Carolina Charlotte, working on vortex dynamics, geometric mechanics and inertial particle dynamics in oscillatory flows. He got his Ph.D in Engineering Mechanics and M.S. in Mathematics from Virginia Tech in 2010 where he studied phase space transport in dynamical systems and long range transport in the atmosphere.

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