



RIVERSIDE | Mechanical Engineering

THE DEPARTMENT OF MECHANICAL ENGINEERING PRESENTS

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A snapping singularity

I will discuss our preliminary work (with A. Dehadrail) on the focusing of kinetic energy and the amplification of various quantities during the snapping motion of the free end of a string or chain. This brief but violent event, with its remarkably large spikes in velocity, acceleration, and tension, is an essentially unavoidable feature of flexible structure dynamics, induced by generic initial and boundary conditions. We are guided by an analytical solution for a geometrically singular limit that features a finite-time singularity in other quantities. Regularization of this singularity does not arise from discretization of the continuous string equations or, equivalently, from the physical discreteness of a chain. It is instead associated with a length scale arising from the geometry of the problem, which evolves according to an anomalously slow curvature scaling.

THURSDAY, OCTOBER 13, 2022

WCH 205/206

11:00 AM - 11:50 AM



Dr. Hanna is Associate Professor in the department of Mechanical Engineering at the University of Nevada, Reno, which he joined in 2019 as a refugee fleeing the great purge of unapologetic mechanicians from Virginia Tech. He is interested in applications of geometry to theoretical and experimental classical mechanics, and is currently thinking about shell buckling, wrinkling of sheets in manufacturing processes, proportional dissipation in dynamical systems, pseudomomentum and material symmetry, new formulations of elasticity, and a few other things.