



ROBOTICS SEMINAR

FRIDAY, March 22, 2019

1305 NEWELL SIMON HALL

3:30-4:30 pm



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Three surprises and a story of prison education

Abstract: I will talk about three results that surprised me. First, I will show that the free configuration space of an elastic wire is path-connected, a result that makes easy a manipulation planning problem that was thought to be hard. Second, I will show a linear relationship between stimulation parameters, skin impedance, and sensation intensity in electrotactile stimulation. This result leads to algorithms that keep sensation intensity constant despite large variability in skin impedance, eliminating a longstanding barrier to practical use of electrotactile stimulation for sensory substitution and haptic feedback. Third, I will show you several obvious ways to use fiducial markers – which everybody knows will improve the performance of Structure-from-Motion (SfM) algorithms for vision-based 3D reconstruction – that work poorly. Then, I will show you a simple but less obvious way to use them that seems to work well. I will also talk about my experience teaching two engineering courses – one on robotics, one on control systems – to students incarcerated at Danville Correctional Center, an Illinois state prison. I will tell you why I did it and what I learned.

Brief Bio: Timothy Bretl comes from the University of Illinois at Urbana-Champaign, where he is both an Associate Professor and the Associate Head for Undergraduate Programs in the Department of Aerospace Engineering. He holds an affiliate appointment in the Coordinated Science Laboratory, where he leads a research group that works on a diverse set of projects in robotics and neuroscience (<http://bretl.csl.illinois.edu/>). He has also received every award for undergraduate teaching that is granted by his department, college, and campus.

Host: Matt Travers

For Appointments: Peggy Martin (pm1e@andrew.cmu.edu)