

Yale University
Computer Science Talk

Intuitive Robot Shared-Control Interfaces via Real-time Motion Planning and Optimization

Host: Marynel Vázquez



Daniel Rakita

Monday - February 21, 2022
4:00 p.m.

Zoom Presentation

Abstract:

My research focuses on making robots intuitive to control and work alongside for as many people as possible, specifically in areas where people are understaffed or overworked such as nursing, homecare, and manufacturing. In this talk, I will overview numerous robot shared-control interfaces I have developed to be intuitive and easy-to-use, even for novice users, by blending users' inputs with robot autonomy on-the-fly. I will highlight novel motion planning and motion optimization methods that enable these interfaces by quickly synthesizing smooth, feasible, and safe motions that effectively reflect objectives specified by the user and robot autonomy signals in real-time. I will comment on my ongoing and future work that will push the potential of these technical methods and physical robot systems, all striving towards broad and motivating applications such as remote homecare, tele-nursing, and assistive technologies.

Bio:

Daniel Rakita is a Ph.D. candidate of computer science at the University of Wisconsin-Madison. His research involves creating motion optimization approaches that allow robot manipulators to move smoothly, safely, and accurately in real-time. Using these motion algorithms as core components, he subsequently develops and evaluates robot shared-control interfaces that are intuitive and easy to use, even for novice users. Previously, he received his Master's Degree in Computer Science from the University of Wisconsin-Madison and a Bachelors of Music Performance from the Indiana University Jacobs School of Music. His work has been supported by a Microsoft PhD Fellowship (2019-2021) and a Cisco Graduate Student Fellowship (2021-2022). He is advised by Michael Gleicher and Bilge Mutlu.