Haruki Nishimura – Projects & Activities

Stanford University

Decentralized Multi-target Search and Coverage Using Hyperparameter Consensus (AA 277), Winter Quarter 2015-2016

We presented a linear-consensus-based algorithm for estimating the unknown positions of multiple targets using a team of sensing agents.

- Project Report

Dynamic Occupancy Grid Filtering for Multi-target Tracking and Goal Location Inference (AA 273), Spring Quarter 2016-2017

We proposed a framework for multi-target tracking that simultaneously estimates unknown goal locations for dynamic obstacles (i.e. pedestrians).

- Project Report

Information-Theoretic Belief-Space Planning for Gaussian Systems with Nonlinear Observations (AA 203), Spring Quarter 2017-2018

We proposed a novel belief-space planning algorithm based on model predictive path integral control (MPPI). We showed that the existing MPPI framework could be applied to Gaussian belief systems with nonlinear observations if the underlying system dynamics is linear.

- Project Report

Human Trajectory Prediction in Socially Interacting Crowds (CS 230), Fall Quarter 2018-2019

This project aimed to predict human trajecotries in dense crowds using Convolutional Neural Networks (CNNs). **CS 230 Fall 2018 Outstanding Poster Award**

- Project Report
- Poster

DR-iLEQG: Distributionally-Robust Optimal Control of Nonlinear Dynamical Systems for Safety-Critical Applications (AA 222), Spring Quarter 2019-2020

This project proposes a novel distributionally-robust optimal controller for nonlinear dynamical systems. For the complete arXiv version, see this paper. **AA 222 Spring 2020 Best Paper Award**

The University of Tokyo

Consortium for Renovating Education of the Future (CoREF) Workshop, March 2014

We organized a science and engineering workshop for high school students on designing parachutes by transferring knowledge of basic aerodynamics concepts. We leveraged a cooperative learning strategy called the “Jigsaw strategy” to design the workshop so the students can understand the fundamental phenomena governing the dynamics of the parachutes. I volunteered as a technical advisor.

Extracurricular

Star Watching Class in Oshika, September 2013 – December 2013

With the support of Non-Governmental Organization JEN, former members of the University of Tokyo Astronomy Club organized and implemented a star watching event for children and parents in Oshika Peninsula, Miyagi Prefecture, Japan, which was heavily hit by a tsunami following the Great Tohoku Earthquake in 2011. The event was intened to energize children in community and motivatae them to become interested in space and stars. I volunteered as the project leader.