**Jason Nezvadovitz**
3527 SW 20th Ave. Unit 638A
Gainesville, FL 32607
Phone: (954)-558-7844
Email: nez.jason7@gmail.com

**Education** *University of Florida (summer 2012, to finish spring 2017)*

- Pursuing M.S. (with thesis) in Control Theory and Dynamics, GPA 4.0, 5/12 courses
  - Spatial geometry 1 & 2, modern linear control, nonlinear & adaptive control
- Obtained B.S. in mechanical engineering with electrical engineering minor, GPA 3.96

**Experience** *Machine Intelligence Lab, UF (summer 2013 - current)*

- Fully autonomous 18-foot loosely-coupled pontoon boat (see: robotx.org)
  - Concurrent-learning based adaptive controller for estimating vehicle inertia, drag coefficients, and local wind while guaranteeing Lyapunov stability
- Fully autonomous submarine (see: subjugator.org)
  - RISE controller for Lyapunov stability despite time-dependent disturbances
  - Sequential-quadratic programming for constrained, energy-optimal thrust allocation to the 8 thrusters on a 6-DOF vehicle
  - Unscented Kalman filter for state estimation and sensor bias estimation
  - Time-optimal trajectory generator given acceleration and velocity constraints
  - Entire GNC architecture handles attitude state as quaternion
  - Optimized marine propeller and nozzle, structurally efficient and modular carbon fiber framework, electronically throttled pneumatics system, and aluminum pressure vessels rated for 150 feet of water all built in house
- Fully autonomous mobile manipulator system
  - Inverse kinematics and controller for 4-DOF robot arm on mecanum wheels

**Employment** *SpaceX, Structures Intern (summer 2016)*

- Designed test structure for the Falcon Heavy interstage and booster-nosecones from the ground up, satisfying an abundance of loading and production efficiency requirements while remaining within the price range of similarly sized stands
- Created Python tool for decomposing loads onto non-orthogonal actuators, visualizing force triads, and sizing their associated hydraulic cylinders
- Developed solution for booster heatshield reusability
- Designed glass windows for stage-separation mechanism inspection at launch site

**Side Projects** See: github.com/jnez71

- Concurrent-learning based adaptive controller for a 2-DOF robot arm under gravity that estimates arm link lengths, effective masses, and local gravity, uses said estimates for inverse kinematics, and maintains Lyapunov stability throughout
- Repetitive-learning based adaptive controller for a 2-DOF robot arm under gravity
- Neural network (NN) controller ROS package for any Euler-Lagrange system
- Iterative ROI thresholding and Luenberger observer for visually tracking a puck in air-hockey, and NN controller for 2-DOF hockey gantry with excessive static friction
- Full 6-DOF simulator for marine vehicles, with 3D visualization, made from scratch
- Controller for both position and angle of underactuated pendulum-balancing robot
- Python library for handling SO(3) objects, with a demonstration of its use in both 3D simulation and attitude control

**Specific Skills** *Python / MatLab / C++ / ROS / NX CAD / Ansys FEA / SolidWorks CAD / Git*