Robert Mitchell Jones

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Objectives

I want to work with a community of researchers to put to use my skills in robotics and control systems and build creative solutions in the world of autonomous systems.

Education

MS Mechanical Science and Engineering **Sept 2015 - present**
University of Illinois at Urbana-Champaign, Urbana, IL.

BS Mechanical Engineering **Sept 2011 - May 2015**
University of Rhode Island, Kingston, RI.

Relevant Coursework

Robust Adaptive Control, Optimum Control Systems, Advanced Robotics Planning, Analysis of Nonlinear Systems, Control of Complex Systems, Control Systems Theory & Design.

Experience

Advanced Controls Research Laboratory, Urbana, IL. **Aug 2014 - present**
Graduate Research Assistant

- Designed a computationally efficient trajectory generation approach using piecewise Bézier curves for differentially flat systems. This approach can be used to generate feasible minimum snap trajectories for quadrotors in the least time with the added advantage of using the convex hulls of Bézier curves to check for any collisions incurred during interpolation. Further analysis and results can be found in the master's thesis.
- Constantly involved with all software-related development in the research group. Implemented path following controllers on ground robots for precise tracking, designed line-of-sight based collision avoidance methods replying purely on directional sensor information, and more recently, geometric controllers were implemented to track aggressive trajectories on quadrotors.

NASA Ames Research Center, Moffett Field, CA. **June 2016 - Aug 2016**
Graduate Intern

- Designed and built an aerial manipulator system for use on a small quadrotor.
- Programmed an onboard controller for execution of manipulator commands during flight.
- Modeled manipulator dynamics in Simulink and developed method for stabilizing vehicle during normal operation and highly dynamic maneuvers.

Greensight Agronomics, Boston, MA. **June 2015 - Sept 2015**
Mechanical Engineer & UAV Pilot

- Developed subsystems for an early-stage startup company delivering autonomous plant monitoring solutions to the agricultural and recreational industries.
- Flew contracted on-site missions mapping various farms, golf courses, athletic fields, etc.

Technical Summary

I have extensive experience with robotics development on quadrotors and ground robots in the realms of controller architecture design, motion planning and trajectory generation. I am very interested in computationally efficient solutions to trajectory generation for mobile robots in cluttered environments.

I am adept at writing **C/C++** software for embedded systems, **Python** for rapid prototyping and high-level decision making, **ROS** packages for communication services, and **MATLAB** and **Simulink** models for analysis and design. I have primarily developed software for ARM-based processors running Linux/FreeRTOS environments.

Publications

- **R M. Jones**, D. Sun, G. B. Haberfeld, A. Lakshmanan, T. Marinho, and N. Hovakimyan. Design and Control of a Small Aerial Manipulator for Indoor Environments. In *AIAA Guidance, Navigation, and Control Conference*, page 1374, Jan. 2017
- T. Marinho, A. Lakshmanan, V. Cichella, C. Widdowson, H. Cui, **R M. Jones**, B. Sebastian, and C. Goudeseune. VR study of human-multicopter interaction in a residential setting. In *2016 IEEE Virtual Reality (VR)*, pages 331–331, Mar. 2016