

jake welde

education

University of Pennsylvania

Candidate for Bachelor of Science,
Mechanical Engineering
Pursuing minors in Computer Science,
French, and Mathematics
Current GPA 3.77
Expected graduation May 2019

Notable Coursework

- Design of Mechatronic Systems
- Robotics: Planning and Perception
- Data Structures and Algorithms
- Intro to Mechanical Design
- Machine Design and Manufacturing
- Engineering Mechanics: Dynamics
- Programming Languages and Technologies

involvement

Underground Shakespeare Company

Co-President

Penn Animal Advocacy

Committee Member

Penn Glee Club

Singer

Science Olympiad at the University of Pennsylvania

Volunteer Event Supervisor

skills

Java C++ ROS MATLAB Linux
Embedded Programming SOLIDWORKS
Circuit Design Manual Milling LaTeX

experience

GRASP Lab, University of Pennsylvania

Fall 2015 - Present

Collaborative research in sensing, planning, and manipulation for high speed aerial robots

- Developed dynamic model and planning strategies for quadrotor equipped with avian-inspired 3DOF manipulator to enable high speed projectile interception
- Contributed to onboard sensing, estimation, and motion planning pipeline to enable dynamic tracking of moving targets using underactuated quadrotor while respecting vehicle's field of view, sensor, and actuator constraints
- Co-author of IEEE/RAL paper presenting our work
- Featured in National Geographic's *Breakthrough* television series explaining our research to the public

Teaching Assistant, *Robotics: Dynamics and Control* Summer 2017

Provided support for online course with nearly 10,000 enrolled learners and a pathway to earn Penn credit towards master's degree

- Developed creative assignments, labs, and projects designed to engage students and verify their learning progress while managing the logistical challenges of online setting
- Recorded coding demo lectures and responded to learner questions and concerns via online forum

Robockey (*Design of Mechatronic Systems*)

Fall 2016

Worked in a team of four on final project to create autonomous robots capable of cooperatively playing modified game of hockey

- Developed electrical and software modules to process infrared and ultrasonic sensor data for puck localization and opponent detection
- Leveraged behavior state machine to enable flexible robot roles based on game conditions
- Effectively compartmentalized highly interdependent tasks and components in both software and hardware design to enable rapid parallel development and seamless team integration
- Closed loop control based on robot localization, puck sensing, and wheel encoders for precision and robustness to collisions
- Undefeated champions of course-wide final tournament