

Jiahao Zhang

Curriculum Vitae

www.jiahaoz.com · 412-576-9236 · jz522@cornell.edu

INTERESTS

Multiagent Robotic Systems, IoT Networks & Sensors, Modular Robots.

EDUCATION

Cornell University, Ithaca, NY, USA

B.Sc of Computer Science, Department of Computer Science

Dec. 2018

B.Sc of Mechanical engineering, Sibley School of Mechanical and Aerospace Engineering

Dec. 2018

RESEARCH EXPERIENCE

DARPA OFFensive Swarm-Enabled Tactics (OFFSET) Program

Sep. 2018 - present

PI: Professor Hadas Kress-Gazit

Autonomous Systems Lab, Cornell University

- Develop Gazebo simulation for decentralized holonomic robot swarm in non-reactive scenarios.
- Optimize collision avoidance and deadlock mitigation for continuous controller implementation.
- Develop AirSim simulation for a swarm of 250 ground/air robot in an urban setting.

National Science Foundation (NSF) Ad-hoc Swarm Robotics

Sep. 2018 - present

PI: Professor Hadas Kress-Gazit

Autonomous Systems Lab, Cornell University

- Develop high-level specifications for an ad-hoc collaborative swarm of robots and humans for accomplishing a high-level evacuation task without central coordination.
- Work on integration plans with HRI, hardware, and software groups.

The Robotic Art Competition (Robotart)

Feb. 2017 - May 2017

PI: Professor Hadas Kress-Gazit

Autonomous Systems Lab, Cornell University

- Implemented motion primitives for a 5-link KUKA YouBot arm using inverse kinematics, trajectory planning, and PID control.
- Built ROS packages to enable KUKA YouBot to paint autonomously in various styles.
- Designed and built a compliant brush holder for KUKA YouBot using rapid prototyping tools.
- Recreated Vincent van Gogh's Starry Night and Andy Warhol's Banana with KUKA YouBot.

IARPA N2N Fingerprint Challenge

April 2017 - Sep. 2017

PI: Professor Amit Lal

SonicMEMS Lab, Cornell University

- Designed and built the mechanical and electrical system for a non-contact optical nail-to-nail (N2N) fingerprint scanning system.
- Developed an algorithm for generating N2N fingerprint images based on SIFT feature matching using OpenCV library, which was later integrated with the hardware.
- Led a team of 4, collected and processed 3500 fingerprints in a week onsite at Johns Hopkins University Applied Physics Lab (APL), as one of the 9 finalist teams.

GHz Ultrasonic Transducer Phased Array

May 2016 - May 2017

PI: Professor Amit Lal

SonicMEMS Lab, Cornell University

- Designed layout of GHz ultrasonic transducer phased array MEMS device with Cadence, and the corresponding testing PCBs with EAGLE.

- Implemented MATLAB code for phasing a 4 by 4 ultrasonic transducer array using GHz radio frequency signals, in order to achieve wave steering and focusing.
- Tested and characterized different transducer array designs using the above hardware and software.
- Compiled a list of materials for potential quarter wave length matching layers for reducing acoustic impedance for GHz ultrasound imaging.
- Deposited parylene thin film on silicon wafer, and characterized its surface topography using profilometer at Cornell NanoScale Science and Technology Facility (CNF).

PROFESSIONAL EXPERIENCE

Hardware Electrical Engineer Feb. 2019 - present
Geegah LLC, Ithaca, NY

- Work includes concepts generation, analog circuit design, mechanical/electronic components prototyping, and process automation.

Hardware Engineering Intern June 2018 - Aug. 2018
Uber ATG, Pittsburgh, PA

- Prototyped a device for applying adhesive film onto glasses, in support of key assembly process of driver-less vehicles.
- Designed and implemented compressed air and vacuum systems to test prototypes.
- Designed and fabricated sheet metal prototypes with both in-house and external manufacturing.

Product Engineering Intern Sep. 2017 - May 2018
Rapyuta Robotics, Tokyo, Japan

- Designed electronics and mechanical prototypes for product development.
- Scripted SolidWorks plug-ins in VBA to facilitate BOM generation and management.
- Designed, conducted, and documented experiments to drive key design decisions on drone design.
- Implemented a Pick-And-Place demo with UArm and Machine Vision Camera in Python and C.
- Instructed and supervised Mechatronics assemblers on prototype and product assembly tasks.

Mechanical Engineering Intern May 2017 - Aug. 2017
iRobot, Bedford, MA

- Performed testing and data analysis on robot prototype to justify and drive key design decisions.
- Implemented design for manufacturability (DFM) requests from contract manufacturers.
- Conceptualized, designed, and fabricated testing fixtures for various sub-assembly prototype testing.
- Developed rubber component prototypes, including planning, designing, and manufacturing molds.

PROJECT TEAM EXPERIENCE

Mechanical Subteam Project Lead Sep. 2014 - present
Cornell Unmanned Air Systems, Ithaca, NY

- Led the design, fabrication, and testing of a 2-axis gimbal and its protective dome for plane camera.
- Designed and fabricated modularized UAV payload mounts, bulkheads, and accessories such as CG machine and plane stand with SolidWorks, 3D printers, machine shop tools and laser cutter.
- Designed and fabricated antenna tracker pitch mechanism, which keeps antennas in-line with plane.
- Fabricated and post-processed composite-based airfoil and fuselage components.
- Assisted as the mechanical representative for emergency fix, crashed plane salvation, and failure analysis during routine test flights at Neno International Airport.

TEACHING & MENTORSHIP

MAE 3780: Mechatronics Teaching Assistant Aug. 2016 - Dec. 2016
Cornell University, Ithaca, NY

- Junior-level 4-credit course, fulfills Mechanical Engineering major requirement for electrical circuits.
- Conducted lab sessions, graded homework and exams, and hosted office hours.

Technician

Sep. 2015 - May 2017

Cornell Rapid Prototyping Lab, Ithaca, NY

- Operated various models of 3D printers, laser cutter, post-processing printed/cut parts for students, faculties, and research labs.
- Advised students on mechanical designs for rapid prototyping and performed design analysis.
- Conducted 3D printer, laser cutter, and fume extractor maintenance.

Engineering Mentor

Sep. 2015 - present

Stooges Education, Hangzhou, China

- Advise high school students on science and engineering projects.
- Help students to brainstorm engineering ideas realizable with high school resources.

VOLUNTEER EXPERIENCE**EurekaFest 2017 Duck N Hover Student Mentor**

Summer 2017

Museum of Science, Boston, MA

- Mentored a group of 5 high school students in finale competition on the design and build of a wind-powered device capable of hovering three stories in the air, carrying rubber ducks as payload.
- My team was the grand champion and our device lifted over 200 rubber ducks.

Home Fire Safety Volunteer

Summer 2018

American Red Cross, Pittsburgh, PA

- Put up door hangers for houses in the neighborhood as a notice for upcoming fire alarm installation.

AWARDS & HONORS**Cornell University College of Engineering**

- Engineering Dean's List (All semesters)
- Engineering Learning Initiatives Undergraduate Research Award (2016)

IARPA Nail to Nail (N2N) Fingerprint Challenge 2017

- Print Provider Prize
- Master Builder Prize

Association for Unmanned Vehicle Systems International (AUVSI)**Student Unmanned Aerial Systems Competition**

- 2nd Place Overall (2016, as team member)
- 2nd Place in Mission (2016, as team member)
- 2nd Place in Flight Readiness Review (2016, as project lead)
- 2nd Place Overall (2017, as project lead)
- 1st Place in Journal (2017, as project lead)
- 2nd Place in Flight Readiness Review (2017, as project lead)
- 3rd Place in Mission (2017, as project lead)

PUBLICATIONS

T. Nathans-Kelly, R. Evans, L. Klein, and **J. Zhang**, *We WOVE, we designed, we conquered: Assessing engineering self-efficacy in a Mechanical Engineering Communication Initiative - Instructor and student perspectives*, 2017 IEEE International Professional Communication Conference

SKILLS

Design - SolidWorks, PTC Creo, ANSYS, COMSOL, Adobe Illustrator/Photoshop, Drawing

Programming - MATLAB, Python, C, ROS, VBA, Unix tools and Scripting

Manufacturing - DFM, injection molding, rubber molding, machine shop, rapid prototyping

Language - English, Mandarin Chinese, Japanese (beginner)

Interest - Freelance graphic design, drawing, acting, boxing, swimming, haircutting