Jacob Hartzer

Curriculum Vitae

Education

2020 – Present
Texas A&M University — **College Station Texas**
Ph.D. Mechanical Engineering — *3.833 GPR*
Research topic: Kalman filtering for simultaneous online sensor calibration and localization

2019 – 2020
Texas A&M University — **College Station Texas**
M.S. Mechanical Engineering — *3.750 GPR*
Thesis: Decentralized Collaborative Localization using Ultra-Wideband Ranging

2015 – 2019
Texas A&M University — **College Station Texas**
B.S. Mechanical Engineering — *3.928 GPR*
Senior Thesis: Development of a highly efficient consumer vehicle for the Shell Eco-Marathon

Professional Experience

2021 – Present
Lockheed Martin Missiles and Fire Control — **Dallas, Texas**
GNC Engineer
- Optimization of Fire-Control algorithms
- Software performance validation

2021
Boeing Defense and Space — **Huntsville, Alabama**
Real-Time Software Engineer
- Developing real-time C++ applications for flight software and control in an agile environment
- Design and implementation of software architecture.
- Implementation of control algorithms and development of unit and integration tests.
- Modernizing legacy Ada programming.
- Creating tools in MatLab and Python to aid development.

2020
Boeing Defense and Space — **Huntsville, Alabama**
M&WS Systems Engineering Analyst
- Developed flight software simulation and jet control algorithms.
- Implemented real time motion compensation algorithms for visual guided systems.

2019
Boeing Defense and Space — **Huntsville, Alabama**
GN&C Engineering Analyst
Developed IMU simulation and supporting models for error analysis.
- Developed comprehensive Monte-Carlo IMU error simulation with gyrocompassing
- Developed efficient gravity anomaly algorithm with numerical propagation
- Developed variable atmospheric model for use in simulation

Summer 2018 **PepsiCo: Frito-Lay North America** **Dallas, Texas**
Automation Engineering Intern
Worked in the development of new automation projects and processes.
- Developed novel bag seal sensing technology with >99.9% accuracy to decrease process downtime
- Developed optimization algorithm for mobile robot to increase throughput by 4.9%

Summer 2017 **Bray International Inc.** **Houston, Texas**
R&D Design Engineering Intern
Sought to develop new valve sensing technologies and a continuous-use lab test station.
- Designed and tested failure intelligence for valve products using LabVIEW
- Developed automation system to save over 12 hours of labor per cycle test

Fall 2016 **Texas A&M Department of Physics and Astronomy** **College Station, Texas**
Physics Undergrad Teaching Fellow
Peer led and taught multiple sections of Freshman-level Newtonian physics.
- Helped decrease student drop rate by 40% through the UTF program

Summer 2016 **NXP Semiconductors** **Austin, Texas**
Reliability Engineering Intern
Developed reliability testing automation scripts as well as managed scripts and webpages for the new product introduction department.
- Developed scripts to automate the validation of reliability tests
- Decreased machine down time by 75%

Research Experience

2019 – Present **Texas A&M Unmanned Systems Lab** **College Station, Texas**
Graduate Researcher
Collaborative localization for ground vehicles.
- Researched novel sensors for use in collaborative localization
- Integrated differential GPS and filtering into the platform
- Developed multiple packages for sensor communication

2018 – 2019 **Texas A&M Unmanned Systems Lab** **College Station, Texas**
Undergraduate Researcher
Guidance and control of autonomous ground robots for improved vehicle safety.
- Developed autonomous omni-robot to improve highway safety

2017 **Texas A&M AggiE-Challenge: Flexiform** **College Station, Texas**
Undergraduate Research Team Lead
Completed research in and developed novel technology for a device capable of creating complexly-curved concrete structures
- Developed silicone with flexible embedded structure that was capable of supporting concrete in a continuous and configurable way.
- Design went on to win AggiE-Challenge

2015 – 2017 **Texas A&M Department of Aerospace Engineering** **College Station, Texas**
Research Assistant
Research in and implementation of real-time computer vision techniques for autonomous control
- Worked on combining ORB-SLAM data with accelerometer data through a Kalman filter
- Developed scripts for data processing and visualization

2015 – 2017 **Texas A&M Department of Mathematics** **College Station, Texas**
Undergraduate Researcher
Development of Python programs in multiple factorization theory and algebraic geometry
- Wrote Sage code for the analysis of Maximal Mediated Sets for polynomial optimization
- Wrote Sage code to analyze Arithmetical Congruence Monoids

Publications

[1] J. Hartzer and S. Saripalli, "Vehicular teamwork: Collaborative localization of autonomous vehicles," in *Proceedings of the IEEE Intelligent Transportation Systems Society Conference*, (Indianapolis, IN), 2021.

[2] J. Hartzer and S. Saripalli, "Autocone: An omnidirectional robot for lane-level cone placement," in *Proceedings of the IEEE Intelligent Vehicles Symposium*, (Las Vegas, NV), p. 440, 2020.

[3] T. De Wolff, J. Hartzer, O. Röhrig, and O. Yürük, "Initial steps in the classification of maximal mediated sets," *Journal of Scientific Computation: Effective Methods in Algebraic Geometry*, vol. 17, 2019.

[4] J. Hartzer and C. O'Neill, "On the periodicity of irreducible elements in arithmetical congruence monoids," *Integers*, vol. 17, 2017.

Research Presentations

December 2017 — **Texas A&M University** — **College Station, Texas**
AggiE-Challenge Video Competition
The Development of a Reusable Mold of Complexly Curved Concrete Structures (Video Presentation)

March 2017 — **Texas A&M University** — **College Station, Texas**
Student Research Week
On the Determination of Maximal Mediated Sets (Symposium Talk)

March 2016 — **Texas A&M University** — **College Station, Texas**
Student Research Week
On the Periodicity of Arithmetical Congruence Monoids (Poster Presentation)

Leadership Experience

2015 – 2019 — **Texas A&M University** — **College Station, Texas**
Texas A&M National Scholar Ambassadors
This organization (TANSA) is devoted to the recruitment and continuing community of national scholars for Texas A&M.
- President: 2018 - 2019
  - Lead all general committee and officer meetings
  - Organize high-level organization goals and outcomes
- Vice-President 2017 - 2018
  - Planned and lead fall and spring retreat for the organization
  - Handled all disciplinary actions regarding members
- Social Executive 2016- 2017
  - Planned and lead monthly organization socials

2016 – 2018 — **Texas A&M University** — **College Station, Texas**
MSC Business Associates
This organization is dedicated to serving the business needs of Texas A&M's student center, the MSC.
- Finance Executive 2017- 2018
  - Directed budget approval process for the MSC and oversaw $1.3MM
- Finance Subcommittee Member: 2016- 2017
  - Was assigned to individual committees to work with other students and employees to plan budget

2015 – 2019 **Texas A&M University** **College Station, Texas**

A&M West Coast Swing Dance Club

This club, Aggie Westies, is a social organization centered around the West Coast Swing style of dance.

- Treasurer
  - Handled the collection of dues for lesson series
  - Planned annual budget for the organization as well as large dance events

Software

Advanced C++: *Real-Time and Modern C++*

MatLab and Simulink: *Dynamic modelling, monte-carlo simulation, and real-time control*

Python: *ROS and SAGE package development*

LabVIEW: *CLDA, Real-Time, Wireless Sensor Network, and NI MyRIO*

SolidWorks: *CSWP, FEA, CFD, Weldments and Sheet Metal*

Intermediate Ada, git, VBA

Honors and Achievements

2019 Shell Eco-marathon Safety Award

2018 Texas A&M Outstanding Senior Engineer

2018 BCS Marathon Finisher: 4:58:24

2017 College of Engineering Deans Excellence Award: Honorable Mention

2015 Brown Foundation Scholar

2015 National Merit Scholar, State Farm Scholarship

2013 Eagle Scout and Silver Palm

Interests

Outdoors Backpacking, Rock Climbing, and Mountain Biking

Music Guitar and Piano

References

Available upon request