Jacob Hartzer

Curriculum Vitae

Education

2019-2020 **Texas A&M University** **College Station Texas**
M.S. Mechanical Engineering *3.750 GPR*
Thesis topic: Development of novel sensing techniques for collaborative localization

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 competition

Professional Experience

Summer 2020 **Boeing Defense and Space** **Huntsville, Alabama (Remote)**
M&WS Systems Engineering Intern
- Developed flight software simulation and control algorithm.
- Security Clearance: Active DoD Secret

Summer 2019 **Boeing Defense and Space** **Huntsville, Alabama**
GN&C Analysis Intern
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

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JHartzer

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

Fall 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

Fall 2018 - Spring 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

Fall 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

Fall 2015 - Spring 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

Fall 2015 - Spring 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, "Autocone: An omnidirectional robot for lane-level cone placement," in *Proceedings of the IEEE Intelligent Vehicles Symposium*, (Las Vegas, NV), p. 440, 2020.

[2] 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.

[3] J. Hartzer and C. O'Neill, "On the periodicity of irreducible elements in arithmetical

congruence monoids," *Integers*, vol. 17, 2017.

Research Presentations

Fall 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)

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

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

Leadership Experience

Fall 2015 - Spring 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

Spring 2016 - Spring 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

Fall 2015 - Fall 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 — SolidWorks: *CSWP, FEA, CFD, Weldments and Sheet Metal*
LabVIEW: *CLDA, Real-Time, Wireless Sensor Network, and NI MyRIO*
Python: *ROS and SAGE package development*

Intermediate	MatLab and Simulink, GIT, VBA
Novice	C++
Basic	C

Honors and Achievements

2019	Shell Eco-marathon Safety Awards
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