Jeremy D. Castagno

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Curriculum Vitae
https://jeremybyu.github.io

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EDUCATION

2021	Ph.D., Robotics, University of Michigan
	Dissertation Title: Mapping and Real-time Navigation
	with Application to Small UAS Urgent Landing
	Research Advisor: Ella Atkins
2018	M.S., Robotics, University of Michigan
2013	B.S., Chemical Engineering with minor in Computer Science, Brigham Young University

RECENT WORK EXPERIENCE

2016 - Present — Graduate Student Research Assistant, A2SYS Lab at University of Michigan, Ann Arbor MI
- Presented rigorous methods to incorporate rooftops as emergency landing sites for drones
- Conducted multi-city analysis predicting roof shapes using deep learning with sensor fusion
- Created state of the art non-convex polygon extraction algorithm for both 2D and 3D data

2019 - 2020 — Independent Contractor, National Security Innovation Network (DOD), Ann Arbor MI
- Reviewed predictive maintenance methods for DOD assets and interviewed personnel
- Presented whitepaper proposal for video/audio information extraction using CV/NLP

2018 - 2020 — Research Intern, NASA Langley, Hampton VA
- Conducted experiments for real-time landing site selection of drones with onboard LiDAR
- Designed software architecture for online sensing with emergency landing directives

2016 - 2016 — Full Stack Web Developer, First Tennessee Financial, Memphis TN
- Led development of website establishing new services with enhanced search through NLP
- Technology Stack: JavaScript (ES2015), Node.js, Gulp, JSON Web Tokens

2013 - 2015 — Process Control Engineer, Valero Energy Corporation, Memphis TN
- Conducted simulation, hardware-in-the-loop, and field testing of control and safety systems
- Led advanced control system upgrade with an estimated savings of 2 million/year

2012 - 2013 — Research Assistant, PRISM Lab at Brigham Young University, Provo UT
- Investigated optimal real-time parameter estimation for towed cable system
- Programmed MATLAB and C++ interfaces for benchmark laboratory systems

JOURNAL PUBLICATIONS

1. **Castagno, J.**; Atkins, E. "Polylidar3D - Fast Polygon Extraction from 3D Data". *Sensors* 2020, *20*, 4819. Link

2. **Castagno, J.**; Atkins, E., "Polylidar – Polygons from Triangular Meshes." *IEEE Robotics and Automation Letters*, vol. 5, no. 3, pp. 4634-4641, July 2020. Link

3. **Castagno, J.**; Atkins, E., "Roof Shape Classification from LiDAR and Satellite Image Data Fusion Using Supervised Learning." *Sensors* 2018, 11, 3960. Link

4. Sun, L.; **Castagno, J.**; Hedengren, J. D., and Beard, R. W., "Parameter Estimation for Towed Cable Systems Using Moving Horizon Estimation", *IEEE Transactions on Aerospace and Electronic Systems*, vol. 51, no. 2, pp. 1432-1446, April 2015. Link

BOOK CHAPTERS

1. **Castagno, J.**; Atkins, E., "Map-Based Planning for Small Unmanned Aircraft Rooftop Landing." In *Handbook on Reinforcement Learning and Control*, Vamvoudakis, Y. Wan, F. L. Lewis, D. Cansever (Eds.), Springer, 2021. Link

CONFERENCE PROCEEDINGS

1. **Castagno, J.**; Ochoa, C.; and Atkins, E. Comprehensive Risk-based Planning for Small Unmanned Aircraft System Rooftop Landing. *International Conference on Unmanned Aircraft Systems* (2018). Link

2. McDonough, K.; **Castagno J.**; Player, J., Atkins, E.M. "RANGR: Risk Aware Navigation and Guidance for Resilience". *AUVSI XPONENTIAL* (2018)

3. **Castagno, J.**; Atkins, E., "Automatic Classification of Roof Shapes for Multicopter Emergency Landing Site Selection." *AIAA Aviation Conference* (2018). Link

ORAL PRESENTATIONS

1. **Castagno J.**; Atkins, E., "Polylidar – Polygons from Triangular Meshes." *IEEE/RSJ International Conference on Intelligent Robots and Systems* (2020). Acceptance Rate: 47%. Link

2. Atkins, E.; **Castagno J**. "Rooftop Landings for Safe Urban Drone Operations." *Amazon Re:MARS* (2019). Invited Speaker. Link

MANUSCRIPTS IN REVIEW

1. **Castagno J.**; Romano M.; Kuevor P.; Atkins, E., "Multi-UAV Wildfire Boundary Estimation using a Semantic Segmentation Neural Network". *Journal of Aerospace Information Systems.* Accepted. Link

ACADEMIC TEACHING EXPERIENCE

Workshop Instructor, Multidisciplinary Design Program – Introduction to Machine Learning (Winter '18)
Developed and taught interactive modules in multi-hour settings. Link

HONORS AND AWARDS

1'st Prize Winner for NSIN Hackathon with $15,000 Contract (2019)

1'st Prize Winner for AFRL Swarm and Search AI Challenge with $27,000 prize (2019)

Innovation Award Winner for AFRL Swarm and Search AI Challenge (2019)

University of Michigan Rackham Merit Fellowship (2016-2021)

BYU Alvina Soffel Barrett Scholarship (2011-2013)

BYU General Engineering Scholarship (2010)

COMMUNITY SERVICE AND OUTREACH

Panelist (2020), First Robotics, Ann Arbor MI

Presenter (2018), Career Fair, Ann Arbor MI

Cub Scouts Leader (2016), Lessons for pre-teens, Ann Arbor MI

Valero Juvenile Justice Mentor Program (2012), Mentor for truant students, San Antonio TX

Engineers Without Borders (2012), Led an engineering team creating low cost water filters, Cusco Peru

Volunteer Representative (2008-2010)**,** Missionary for The Church of Jesus Christ of Latter-day Saints, India

PROFESSIONAL MEMBERSHIPS AND SERVICE

Member of American Institute of Aeronautics and Astronautics (AIAA)

Member of Institute of Electrical and Electronics Engineers (IEEE)

Reviewer for: IEEE Transactions on Intelligent Transportation Systems, AIAA Journal of Aerospace Information Systems, MDPI Sensors, MDPI Remote Sensing

MEDIA COVERAGE

"A2Sys Lab takes first in firefighting drone competition", in [University of Michigan Robotics](#)

"Swarm and Search AI winners recognized during visit of HMS Queen Elizabeth", in [Wright-Patterson AFB](#)