

# Seth Nielsen

## Electrical & Computer Engineering | MS Student

in [linkedin.com/in/nielsenseth](https://www.linkedin.com/in/nielsenseth)  [github.com/sethnielsen](https://github.com/sethnielsen)  
@ [sethnielsen@gmail.com](mailto:sethnielsen@gmail.com)  U.S. Citizen  +1 540 604 4632

## EDUCATION — BRIGHAM YOUNG UNIVERSITY

August 2021 Master of Science: Electrical and Computer Engineering | Advisor: Randy Beard

August 2018 Bachelor of Science: Mechanical Engineering with Computer Science minor

## WORK EXPERIENCE

- |                                    |  |
|------------------------------------|--|
| <b>Present</b><br>May 2018         | <b>Graduate Research Assistant — Autonomous Landings for UAVs   BYU MAGICC Lab   Provo, UT</b> <ul style="list-style-type: none"><li>➤ Investigated the use of various sensors in the autonomous landing of multirotors on arbitrary ships at sea and of eVTOL aircraft in urban environments</li><li>➤ Extended Microsoft AirSim, a simulator for multirotors, to include tiltrotor eVTOL aircraft, including dynamics model, control inputs, animated mesh, and PX4 autopilot integration in photorealistic city environment (<a href="#">GitHub link</a>)</li><li>➤ Created a software-in-the-loop simulation tool that combines high-end graphics with real autopilot software to produce a high-fidelity camera and physics simulator, used by other students for research and in a BYU course on quadrotor control</li></ul> <div><span>C++</span> <span>Python</span> <span>Controls</span> <span>Simulation</span> <span>SITL</span> <span>Software Engineering</span> <span>Deep Learning</span> <span>Unreal Engine</span></div> |
| <b>Dec 2017</b><br><b>May 2017</b> | <b>Robotics Internship — Lead, full ownership of project   Hall Labs   Provo, UT</b> <ul style="list-style-type: none"><li>➤ Designed and built prototype of robotic self-parking chair capable of moving a 180-lb person</li><li>➤ Produced mechanical design in CAD and manufactured it, and designed and built the circuitry</li><li>➤ Wrote high-level and low-level software for onboard computer and microcontrollers</li></ul> <div><span>Embedded Programming</span> <span>C++</span> <span>Python</span> <span>Estimation</span> <span>Circuits</span> <span>CAD</span> <span>Prototyping</span></div>  |

## SKILLS

- |                     |  |
|---------------------|--|
| <b>Programming</b>  | C++, Python, Rust, Java, MATLAB, Embedded, High Performance Computing                                    |
| <b>Tools</b>        | Linux (Arch, Ubuntu), Windows, Unreal Engine, Qt   |
| <b>Experiential</b> | Driving independent and team projects to completion, leading teams, using Git to manage large code bases |

## PROJECTS

- |   |                      |
|---|----------------------|
| <b>UNIVERSITY ROVER CHALLENGE — 1<sup>ST</sup> PLACE IN AUTONOMOUS TRAVERSAL TASK</b> <ul style="list-style-type: none"><li>➤ Lead autonomous navigation engineer for the BYU Mars Rover Team: the only team to complete the final, fully autonomous navigation portion of task (<a href="#">YouTube link</a>)</li><li>➤ One of the lead operators of the rover throughout development, testing, and competition; implemented much of the team's user interface and networking software</li><li>➤ Wrote code for state machine of obstacle detection and avoidance using lidar and potential field avoidance algorithm</li><li>➤ Trained deep neural network to detect goal markers and adapted it for real-time inference on rover, achieved nearly perfect accuracy during competition</li><li>➤ Implemented controller for GPS waypoint following and vision-based controller to approach within required 2 m radius of goal marker</li></ul> <div><span>C++</span> <span>Python</span> <span>GNC</span> <span>Estimation</span> <span>Controls</span> <span>Software Engineering</span> <span>Deep Learning</span> <span>Leadership</span> <span>Operation</span></div> | JAN 2017 — JUNE 2018 |
| <b>CO-FOUNDER, TESTING LEAD, AND SECRETARY OF BYU ROCKETRY CLUB</b> <ul style="list-style-type: none"><li>➤ Co-founded the BYU Rocketry Club; now 60+ members including a university-funded capstone team</li><li>➤ Competed in IREC 2017 as avionics lead, achieved 95% of target apogee in competition launch</li><li>➤ Created Python simulation to model active guidance of rocket to a target apogee using airbrake system, gathered wind-tunnel data to improve modelling</li><li>➤ Managed communication between team and faculty; ensured all project milestones were met on time</li></ul> <div><span>Python</span> <span>MATLAB</span> <span>LabView</span> <span>Simulation</span> <span>Testing</span> <span>Leadership</span></div>  | AUG 2016 — AUG 2017  |