

# JACOB MORONI OLSON

AUTONOMY · CONTROLS · PERCEPTION

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## EXPERIENCE

### Fortem Technologies

Pleasant Grove, Utah

SENIOR ALGORITHMS ENGINEER

Sep 2019 - Present

- Researching, developing, and implementing new autonomy and control algorithms for DroneHunter
- Collaborating on estimation and tracking development
- Performing system dynamics analysis to improve control and capture performance
- Designing simulation, visualization, and analysis tools to speed development of new features
- Planning and leading hardware testing and data collections for DroneHunter
- Collaborating and planning development with DroneHunter software team and algorithms team
- C++ | Python | ROS | ArduPilot | OpenCV | PyQt | Qt | Bash | Git | Java | Conan

### BYU MAGICC Lab

Provo, Utah

RESEARCH ASSISTANT

Sep 2017 - Oct 2019

- Software algorithm and GUI development in Python and C++ with ROS
- Development and testing in a simulation environment using ROS Gazebo
- Implemented research software on multirotor hardware
- Integrated perception sensors such as RGB-D cameras, LIDAR sensors, and ultrasonic sonar sensors
- Gained in-depth understanding of 3D mapping, perception, and localization techniques
- Version control using git

### Lockheed Martin Procerus Technologies

Vineyard, Utah

ENGINEERING INTERN

May 2017 - August 2019

- Designed and implemented several test fixtures used in production and engineering
- Led a product design change to improve manufacturability and reliability
- Wrote and implemented robust software for test fixtures used in production
- Assisted with debugging and building production software
- Wrote documentation and build documents for products

### Brigham Young University

Provo, Utah

BYU CAPSTONE

Sep 2016 - Apr 2017

- Worked with a team of five to design and build a production-ready handheld dusting vacuum
- Learned effective design process implementation and functional prototyping procedures
- Surface and solid modeling using CAD software

### BYU Robotics and Dynamics Lab

Provo, Utah

UNDERGRAD RESEARCH ASSISTANT

Sep 2016 - Apr 2017

- Applied for and received a grant (ORCA) to fund research
- Calibration and integration of several sensors using Python with ROS
- Mechatronic design using Eagle and data sheets
- Gained in-depth understanding of robotics platforms including compliant and soft robotics

### Autoliv

Ogden, Utah

MECHANICAL ENGINEERING INTERN

May 2016 - Aug 2016

- Member of research and development team for frontal airbag modules
- Worked independently and with teams to model and build various test fixtures
- Modeled a variety of complex parts using solid and surface modeling in Solidworks

## EDUCATION

### Brigham Young University

Provo, Utah

MASTERS IN MECHANICAL ENGINEERING

December 2019

- 3.93 GPA
- Thesis: Collaborative UAV Planning, Mapping, and Exploration in GPS-Denied Environments

### Brigham Young University

Provo, Utah

B.S. IN MECHANICAL ENGINEERING · MINOR IN BUSINESS MANAGEMENT

Apr 2017

- 3.81 GPA
- Four-year Academic Scholarship - half tuition

## COURSEWORK

AUTONOMOUS SYSTEMS	• SLAM, Kalman Filters, Particle Filters, Markov Decision Processes
FLIGHT DYNAMICS AND CONTROL	• Develop autopilot flight stack for fixed wing and multirotor UAVs
DEEP LEARNING	• Develop and implement several deep neural network architectures and techniques
ROBOTIC VISION	• Object tracking, structure from motion, visual odometry, obstacle avoidance
ROBOTICS AND CONTROLS	• PID, state space control, loopshaping, and kinematics of manipulators
OPTIMIZATION	• Modeling and design of several optimization techniques
C++ GUI DESIGN	• Object Oriented Programming and GUI design using Qt and OSG
LINEAR & NONLINEAR SYSTEM THEORY	• Stability analysis and controller design