

# Parker C. Lusk

PERCEPTION · ESTIMATION · CONTROLS

Provo, UT 84604

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## Education

### Brigham Young University

M.S. ELECTRICAL AND COMPUTER ENGINEERING

- 4.00/4.00 GPA
- Advisor: Randy Beard

Provo, UT

Aug. 2016 - Aug. 2018

### Brigham Young University

B.S. ELECTRICAL ENGINEERING

- 3.78/4.00 GPA

Provo, UT

Jan. 2013 - Aug. 2016

## Work Experience

### BYU MAGICC Lab / Center for Unmanned Aircraft Systems

GRADUATE RESEARCH ASSISTANT

- Safe2Ditch: Joint NASA Langley project for autonomous emergency landing of drones
- Visual multiple target tracking using monocular camera on autonomous aerial vehicles

Provo, UT

Aug. 2016 - Aug. 2018

### LGS Innovations

EMBEDDED DEVELOPER / PCB DESIGNER

- Worked with the Intel Edison embedded Linux Platform; designed and assembled PCB add-ons with Cadsoft EAGLE
- Wrote NodeJS app to control embedded hardware

Westminster, CO

Summer 2015

### Verisage and Coding Campus

SOFTWARE DEVELOPER / COURSE INSTRUCTOR

- Managed Verisage projects and worked with clients to add value to their products
- Taught students and developed curriculum at Coding Campus

Provo, UT

Mar. 2013 - Apr. 2015

## Relevant Advanced Coursework

### Signals & Systems

Digital Comms Theory, Math of Signals & Systems, Stochastic Processes, Statistical DSP

### Control Theory

Feedback Control, Flight Dynamics and Control, Linear System Theory, Nonlinear System Theory

### Robotics and AI

Robot Soccer, Bayesian Methods, Deep Learning, Robotic Vision, Autonomous Systems

## Skills

### Research

Multiple target tracking, Recursive Bayesian filtering (i.e., Kalman, particle), autopilot implementation, simulation

### Programming

C/C++, Python, MATLAB/Simulink, ROS/Gazebo, OpenCV, TensorFlow, Git

### Embedded

STM32, NVIDIA TX2, ODROID, Naze32, Pixhawk, Arduino

## Extracurricular Activity

**Teaching Assistant**, EE Senior Project - Robot Soccer

Winter 2017 Brigham Young University

**Founder, President**, BYU Mechatronics Club

Fall 2014 - Winter 2016 Brigham Young University

**Technical Advisor**, KVM Foundation

2014 Visakhapatnam, India

**Student**, Pembroke-King's Programme

Summer 2013 Cambridge University, UK

## Selected Projects

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### The DesktopQuad

Provo, UT

PERSONAL RESEARCH PROJECT

2017

- A custom built tethered micro quad with an upward facing camera
- Particle filter based localization using IMU and ArUco fiducial markers
- Implemented in hardware by extending ROSflight, a custom autopilot project built in the BYU MAGICC Lab
- ROS/C++ implementation with corresponding simulation in Gazebo

### Stereo Camera Baseball Catcher

Brigham Young University

GRADUATE CLASS PROJECT: ROBOTIC VISION

March 2017

- In a team of two, used a stereo rig to estimate depth of incoming baseballs
- Used a online least squares optimization to command an X-Y actuated net to consistently catch baseballs

### Robot Soccer

Brigham Young University

ECEN SENIOR PROJECT

Winter 2016

- Worked with a team of four to design, build, and program two ODROID based mobile robots to play soccer
- Used ROS/Python to implement motion control, state estimation, computer vision, and AI algorithms
- Won first place in a ten team competition at BYU

### iOS Bluetooth Shooter

Provo, UT

PERSONAL PROJECT

Dec. 2015

- Wrote iOS app to communicate via Bluetooth with a custom made toy missile shooter.

## Honors & Awards

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**Fellowship**, Utah NASA Space Grant Consortium

Aug. 2017 - Apr. 2018 Brigham Young University

**Invited**, Phi Kappa Phi

2017 Brigham Young University

**Invited**, IEEE-Eta Kappa Nu

2016 Brigham Young University

**Recipient**, Heritage Scholarship

Jan. 2013 - Aug. 2016 Brigham Young University

## Publications

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- [1] P. Lusk and R. Beard, "Visual Multiple Target Tracking From a Descending Aerial Platform," in *American Control Conference*, 2018. (In review). Available at: <http://scholarsarchive.byu.edu/studentpub/218>.
- [2] J. Lee, J. Millard, P. Lusk, R. Beard, "Autonomous target following with a monocular camera on UAS using the Recursive-RANSAC tracker," in *American Control Conference*, 2018. (In review).