

**School Address:**

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**Zachary Ligham**

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**PROFESSIONAL SUMMARY:**

Sophomore Aerospace Engineering Major with a strong understanding of fluids, controls, and structures seeking a summer internship position in design and test engineering

**EDUCATION:**

**Worcester Polytechnic Institute (WPI), Worcester, MA** **May 2018**

Master of Science with Propulsion Concentration GPA 3.5/4.0

Bachelor of Science in Astronautical Engineering, Minor in Spanish; GPA 3.2/4.0

**RELEVANT COURSES:**

Advanced Aircraft Dynamics and Control • Guidance, Navigation, and Communication • Structural Dynamics • Aerodynamics • Aerospace Structures • Compressible Fluids • Control of Dynamical Systems • Thermodynamics • Atmospheric and Space Environments • Engineering Experimentation

**PROJECT EXPERIENCE:**

**Fixed-Wing MAV Trajectory Seeking Simulation, WPI** **January 2015-Present**

- Simulated a dynamical model of a UAV using IMU, GPS, and air data sensors inputs
- Developed trajectory tracking algorithms and noise filters (Kalman and Low-Pass filters)
- Designed a simulation to test guidance and tracking capabilities with simulated noise using Dubins trajectory tracking
- Calculated the effectiveness of the state estimations and control inputs

**AIAA Design, Build, Fly Competition (DBF), WPI** **October 2015-Present**

- Designed two fully functional MAV's to complete the 2016 AIAA DBF competition
- Manufactured test prototypes of both aircraft using laser cutters, drills, and hand tools
- Tested prototypes in a wind tunnel to discover the calculated lift versus the actual lift

**Boeing 747-500 Altitude Hold Control/Numeric Simulation** **October 2015-December 2015**

- Created a numerical simulation with 12 state equations to model flight dynamics
- Used a linear quadratic regulator to optimize control efficiency and effectivity by minimizing response time and minimizing control inputs
- Simulated the altitude hold control and modeled flight at different altitudes and trim conditions

**Missile/Aircraft Intercept Simulation, WPI** **September 2015-October 2015**

- Applied the relationship of positions and velocities in inertial and body fixed reference frames
- Designed Kalman Filters in MATLAB to filter random noise from a Gaussian distribution and to estimate the missile and aircraft position from GPS and IMU data
- Developed a MATLAB script to intercept a simulated aircraft of unknown trajectory

**WORK EXPERIENCE:**

**Kampai Japanese Steak House, Branford, CT** **February 2014-August 2014**

- Developed customer service skills by interacting with a wide variety of customers

**Izod Outlet Store, Clinton, CT** **August 2013-April 2014**

- Sold clothes to customers, maintained aesthetic appeal of the store, and trained new employees

**SOFTWARE SKILLS:**

MATLAB, Solidworks, LabVIEW, AutoCAD, Microsoft Office

**MACHINING SKILLS:**

Laser Cutter, Pneumatic Tools, Drill Press, Shear, Grinder, Welding

**LEADERSHIP EXPERIENCE:**

**Colleges Against Cancer Fundraising Chair, WPI, Worcester, MA** **August 2015-Present**

- Organized the first annual Purple Gala which raised over \$4,074 for Relay for Life
- Coordinated fundraising workshops to provide Relay for Life teams with fundraising tips and ideas
- Connected students to an external vendor for an event shirts fundraiser

**House Manager, Tau Kappa Epsilon Fraternity-Zeta Mu chapter, WPI** **September 2015-December 2015**

- Managed 60 brothers and encouraged completion of house duties
- Maintained house well-being by making drywall, plumbing, and electrical repairs
- Provided assistance with household tasks where necessary