John Martin Jr.

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EDUCATION

Stevens Institute of Technology **2015 –**
Ph.D. in Mechanical Engineering

Columbia University **2013 – 2015**
Graduate coursework in Computer Science

University of Maryland **2009 – 2012**
Double B.S. in Physics and Aerospace Engineering

RESEARCH EXPERIENCE

Robust Field Autonomy Laboratory - Stevens Institute of Technology **2015 –**
Graduate Research Assistant – Advisor: Brendan Englot

I develop models and algorithms to support decision making, in addition to safe and efficient learning under uncertainty and risk. My current work lies at the intersection of optimization, control, probabilistic modeling, and optimal transport.

Alfred Gessow Rotorcraft Center - University of Maryland **2011 – 2012**
Undergraduate Research Assistant

Researched various techniques to control a RC tilt-wing air vehicle. My studies focused on dynamic modeling, system identification, feedback control, and digital filtering methods with embedded processors.

Autonomous Vehicle Laboratory - University of Maryland **2010 – 2011**
Undergraduate Research Assistant

Investigated navigation strategies for novel robotic platforms, including an insect-inspired crawling robot. I implemented *optical-flow algorithms* for quad-rotor velocimetry, integrated sensors, and developed a method to maneuver a robot toward radiation sources.

Robotics@Maryland - University of Maryland **2009 – 2011**
Project Leader

Managed $20 - 30$ undergraduates designing and fabricating an autonomous underwater robot from scratch. With the help of other leaders, I coordinated public-relation events, project demonstrations, design reviews, and university showcases. Additionally, I provided technical advice throughout the design and fabrication process.

PROFESSIONAL EXPERIENCE

Piasecki Aircraft Corporation **2017 –**
Part-time Analytical Consultant

- Control systems lead on a Phase I SBIR: accommodate casualty conditions with an adaptive control system
- Proposed new research for SBIR, STTR, future DARPA programs and supported RFI responses
- Developed communication software in C++ to transmit UAV sensor data over Iridium data link
- Provide analytical advice on autonomy system design and fly-by-wire architectures
- Prototyped adaptive control algorithms for improving helicopter endurance

Sikorsky Aircraft **2012 – 2015**
Robotics and Flight Controls Engineer

- Supported development of a vehicle-independent architecture for a UAV motion planner
- Developed, integrated, and flight tested motion planning algorithms on a full-scale S-76 helicopter
- Developed a C-based *simplex linear program solver* to optimize speeds along a curve

- Developed and maintained visualization software with Open-Scene-Graph and Python
- Developed, integrated, and tested flight control algorithms on the x-76 opv and s-97 helicopters
- Developed a simulation interface to emulate the entire s-97 avionics system
- Generated c-code from matlab and integrated the output into a real-time operating system
- Participated in peer reviews to qualify flight-critical software
- Reviewed and generated avionic-systems wiring schematics

TEACHING EXPERIENCE

Stevens Institute of Technology, Advanced Robotics (ME-654) **Spring 2017**
Guest Lecture: Reinforcement Learning Basics
I co-taught a lecture with other instructors, introducing students to the basics of RL.

Stevens Institute of Technology, Senior Design (ME-423) **Fall 2014**
Guest Lecture: Sikorsky R&D: Motion Planning for Autonomous Rotorcraft
I gave an industry guest lecture on motion planning algorithms for autonomous helicopters.

REFEREED PUBLICATIONS

J. Martin, J. Wang, B. Englot, "Sparse Gaussian Process Temporal Difference Learning for Marine Robot Navigation" in *2nd Annual Conference on Robot Learning (CoRL)*, 2018.

J. Martin, B. Englot, "Extending Model-based Policy Gradients for Robots in Heteroscedastic Environments", in *1st Annual Conference on Robot Learning (CoRL)*, 2017.

POSTERS

J. Martin, Z. Xing, Z. Yao, I. Florescu, B. Englot, "Distributed Gaussian Process Temporal Differences for Actor-critic Learning" in *New York Academy of Sciences, Machine Learning Symposium, 2018*

AWARDS

Department of Homeland Security Doctoral Fellow **Sep. 2015**
Provided four years of academic and research funding.

AHS Howard Hughes Award **Feb. 2015**
Accepted on behalf of the Sikorsky Autonomous Research Aircraft team, for achieving completely autonomous flight with an S-76 helicopter, including takeoff, path planning, navigation to an objective, and landing zone selection.

COMPUTER SKILLS

Languages

- *Currently Proficient:* python, c, c++, r, cmake, make, , matlab
- *Was once Proficient:* ocaml, yacc, simulink, pddl, bash, sed
- *Competent:* fortran, awk, lisp, labview, vbscript, html, xml, css, php

Libraries/Tools

- tensorflow, pthread, openmp, gtest, eigen, boost, openscenegraph, real-time workshop,threadsanitize, valgrind