Winter J. Guerra

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Work & Academic Experience

2016-Present

MIT AeroAstro

MEng Student in State Estimation, Planning, and Simulation for UAVs in Aggressive Flight. Advised by Prof. Sertac Karaman

- Published novel, in-the-loop photorealistic virtual camera system for testing UAV state estimation algorithms in aggressive flight ($\geq 6.7\,\mathrm{m\,s^{-1}}, \geq 27.5\,\mathrm{m\,s^{-2}}$).[1] Using this system, camera images are rendered at $\leq 180\,\mathrm{Hz}$ and live streamed to the UAV – allowing for testing of VIO algorithms under arbitrary environment conditions.

Spring 2017

MIT EE/CS

Teaching Assistant for *Robotics: Science & Systems I*

- Gave deep technical instruction on real-world perception algorithm implementation techniques that greatly improved class performance.
- Fielded 60% of student online questions with an average response time of 36 minutes.

July 2016

MIT Lincoln Laboratory

Associate Instructor for Robotics Summer Institute

- Authored example ROS navigation and perception algorithms for class' autonomous car platform.
- Spearheaded full-stack improvements to the RACECAR autonomous vehicle educational platform.

Summer 2015

MIT CSAIL[2]

Researcher in Natural Language Processing

- Created an algorithm that extracts conclusions of unstructured oncology papers from PUBMED and synthesizes relevant results to user queries.

Summer 2014

Akamai Technologies

Server Platform QA Engineering Intern

- Engineered a server stress testing tool 2.7+ times more powerful than Akamai's prior tool; reduced costs of Akamai's QA team by 8x for large-scale production tests.

2010-2011

Makerbot Industries

Manufacturing Intern

- Developed new embedded firmware features for AVR-based motherboard on Makerbot products.

[1] $6.7\,\mathrm{m\,s^{-1}} = 24.1 km/h = 15 mph$

[2] CSAIL: Computer Science Artificial Intelligence Laboratory

Education

June 2019 (Expected)

Massachusetts Institute of Technology

Masters of Engineering in EE/CS (4.4/5.0)

2017

Massachusetts Institute of Technology

Bachelor of Engineering in EE/CS (4.1/5.0)

Publications

ISER 2018: Int'l Symp. on Experimen'l Robotics

"The Blackbird Dataset: A large-scale dataset for UAV perception in aggressive flight".

Antonini, Guerra, Murali, Sayre-McCord, and Karaman. ***(In press)***

ICRA 2018: Int'l Conf. on Robotics & Automation

"Visual-inertial navigation algorithm development using photorealistic camera simulation in the loop".

Sayre-McCord, Guerra, Antonini, Arneberg, Brown, Cavalheiro, Fang, Gorodetsky, McCoy, Quilter, Riether, Tal, Terzioglu, Carlone, and Karaman.

ISEC 2017: Integrated STEM Education Conf.

"Project-based, collaborative, algorithmic robotics for high school students: Programming self-driving race cars at MIT".

Karaman, Anders, Boulet, Connor, Gregson, Guerra, Guldner, Mohamoud, Plancher, and Shin.

IJID 2017: Int'l Journal of Infectious Diseases

"Planning an innovation marathon at an infectious disease conference with results from the International Meeting on Emerging Diseases and Surveillance 2016 Hackathon".

Ramatowski, Lee, Mantzavino, Ribas, Guerra, Preston, Schernhammer, Madoff, and Lassmann.

Relevant Coursework

Visual Navigation for Autonomous Vehicles

Intelligent Robot Manipulation

Underactuated Robotics

Advances in Computer Vision

Robotics: Science and Systems I *(TA[3] Position)*

Advanced Natural Language Processing

Introduction to Machine Learning

[3] TA: MIT Teaching Assistant