

# Winter J. Guerra

## EDUCATION

**Massachusetts Institute of Technology** 2019  
MASTERS OF ENGINEERING IN EE/CS (4.5/5.0)  
**Massachusetts Institute of Technology** 2017  
BACHELOR OF SCIENCE IN EE/CS (4.1/5.0)

## WORK & ACADEMIC EXPERIENCE

**SRI International** JUNE 2020-PRESENT  
Computer Scientist II

- Architected parallel, GPU-accelerated Kubernetes pipeline for ML image embedding inference and KNN search on 10 terrabyte dataset. Accelerated image indexing & search time from 4 days to a few hours.

**MIT AeroAstro** 2017-2019

MEng Student in visual 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 visual state estimation in agile flight ( $\geq 13.8 \text{ m s}^{-1}$ ,  $\geq 27.5 \text{ m s}^{-2}$ ).<sup>1</sup>
- Architected the simulation phase of the 2019 AlphaPilot/Lockheed Martin AI Drone Racing Innovation Challenge (\$1M grand prize).

**MIT EE/CS** SPRING 2017

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.

**MIT Lincoln Laboratory** SUMMER 2016

Associate Instructor for Robotics Summer Institute

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

**MIT CSAIL<sup>2</sup>** SUMMER 2015

Researcher in Natural Language Processing

**Akamai Technologies** SUMMER 2014

Server Platform QA Engineering Intern

**Makerbot Industries** 2010-2011

AVR Firmware Intern

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## PUBLICATIONS

### IJRR '19: Int'l Journal of Robotics Research

"The Blackbird UAV Dataset".

Antonini\*, **Guerra\***, Murali, Sayre-McCord, and Karaman.

### IIROS '19: Int'l Conf. on Intelligent Robots & Sys.

"FlightGoggles: Photorealistic Sensor Simulation for Perception-driven Robotics using Photogrammetry and Virtual Reality".

**Guerra**, Tal, Murali, Ryou, and Karaman.

### ACC '19: American Controls Conference

"Perception-aware trajectory generation for aggressive quadrotor flight using differential flatness".

Murali, Spasojevic, **Guerra**, and Karaman.

### ISER '18: 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.

### ICRA '18: 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 '17: 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.

## SKILLS

### SOFTWARE LANGUAGES

C/C++, C#/.NET, Python, Javascript, MATLAB, Julia, Bash, Swift, and Java.

### FRAMEWORKS

OpenCV, PyTorch, Eigen, PCL, ROS, LCM, ZeroMQ, Halide, NumPy, Node.js, Express.js, and Gulp.

### TOOLS

Kubernetes, Ansible, Docker, CMake, AWS (EC2, S3, Lambda, etc.), Unity3D, Gazebo, OptiTrack, and Git.

\*Both authors contributed equally to this work.

<sup>1</sup> $13.8 \text{ m s}^{-1} = 49.7 \text{ km/h} = 30.9 \text{ mph}$

<sup>2</sup>CSAIL: Computer Science Artificial Intelligence Laboratory