

# Patrick Grady

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## Education

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**Georgia Institute of Technology**

*PhD Robotics*

**Atlanta, GA**

*2018-cur.*

**Duke University**

*BS Computer Science, Electrical and Computer Engineering*

**Durham, NC**

*2014-2018*

## Publications

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- *Learning to Collaborate from Simulation for Robot-Assisted Dressing* - Alexander Clegg, Zackory Erickson, **Patrick Grady**, Greg Turk, Charles Kemp, C. Karen Liu, *IEEE Robotics and Automation Letters (RA-L)* 2019
- *A Study of Energy Losses in the World's Most Fuel Efficient Vehicle* - **Patrick Grady**, Gerry Chen, Shomik Verma, Aniruddh Marellapudi, Nico Hotz, *IEEE Vehicle Power and Propulsion Conference (VPPC)* 2019 (oral)

## Technical Experience

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**Facebook Reality Labs**

*Research Intern*

*Summer 2020*

- Developing uncertainty-aware hand pose estimation for robust hand-object interaction

**Healthcare Robotics Lab**

*Graduate Research Assistant with Dr Charlie Kemp*

*2018 - cur*

- Grasp contact mapping and synthesis from physics simulation
- Simulation-to-real transfer of Deep RL policies for robot-assisted dressing

**Duke Electric Vehicles**

*President (2016-2018), Electrical Lead (2014-2016)*

*2014 - 2018*

- Guinness World Record: Most efficient electric vehicle. 27,482 MPGe (battery-electric)
- Guinness World Record: Most fuel-efficient vehicle. 14,573 MPG (hydrogen fuel cell)
- Led team of 15 undergraduates to design battery and fuel cell powered vehicles for the Shell Eco-Marathon
- Vehicle designer, high level architect of vehicle powertrain and aerodynamics. Justified with extensive simulation and real-world testing

**NVIDIA Circuits Research Group**

*Research Intern*

*Summer 2017*

- High-speed signalling for next-gen memory to GPU communications
- Benchmarked ground-referenced 25 Gbps signalling test chips

**Cummer Lab**

*Undergraduate Research Assistant*

*2017 - 2018*

- 4D imaging of lightning using wide-bandwidth interferometry

- Voxel-based signal processing for high-fidelity maps

## Teaching Experience

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### Visiting Lecturer

*Politeknik Brunei, Brunei*

*Mar 2019*

- Invited to lecture on design and integration of BLDC motor drives

### Invited Talks

- *14,500 MPG: Design of the World's Most Fuel Efficient Vehicle.* Duke University *Feb 2019*

### Graduate Teaching Assistant

- CS 7463 - Deep Learning *Spring 2020*
- CS 6476 - Computer Vision *Fall 2019*
- ECE 3072 - Electrical Energy *Fall 2018*

### Undergraduate Teaching Assistant

- ECE 110 - Fundamentals of Electrical and Computer Engineering *Spring 2016*
- ECE 230 - Microelectronic Devices and Circuits, Projects Lab *Fall 2016*

## Selected Projects

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### Online Imitation Learning for Warm-Starting of DQN

*CS 8803 Class Project [Link]*

*2019*

- Developed RL agent to play OpenAI Gym car racing environment
- Leveraged experience of an oracle agent to accelerate training of Deep Q Network
- Achieved human-level performance with 6x fewer training episodes

### EasyController2 BLDC Motor Drive

*Duke Electric Vehicles*

*2019*

- Open source design for BLDC motor controller, board design and code
- Used as reference design and teaching aid for multiple Eco-Marathon teams

## Awards

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**Guinness World Record:** Most efficient electric vehicle, 27,482 MPG *2019*

**Guinness World Record:** Most fuel efficient vehicle, 14,573 MPG *2018*

**Shell Eco-Marathon:** First place battery-electric prototype. Best of 25 teams *2018*

**Shell Eco-Marathon:** First place hydrogen prototype. Best of 7 teams *2018*

**Shell Eco-Marathon:** First place battery-electric prototype. Best of 30 teams *2017*

**Georgia Tech CreateX:** Idea2Prototype grant *2019*

**HackMIT:** Winner *2016*

**HackDuke:** Winner *2015*

**Microsoft Code Competition:** Winner. Best of 30 teams *2015, 2017*

**ACM IC Programming Contest:** 5th of 180 teams in Mid-Atlantic conference *2015*

**FAA Private Pilot:** Glider

**Media Coverage:** [Clean Technica] [News and Observer] [Killer Innovations] [Duke Chronicle]