Patrick Grady

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Education

Georgia Institute of Technology **Atlanta, GA**
PhD Robotics, MSCS Machine Learning *2018-cur.*

Duke University **Durham, NC**
BS Computer Science, Electrical and Computer Engineering *2014-2018*

Publications

- *ContactOpt: Optimizing Contact to Improve Grasps* - **Patrick Grady**, Chengcheng Tang, Christopher D. Twigg, Minh Vo, Samarth Brahmbhatt, Charles C. Kemp, *Conference on Computer Vision and Pattern Recognition (CVPR) 2021*
- *Masked Reconstruction based Self-Supervision for Human Activity Recognition* - Harish Haresamudram, Apoorva Beedu, Varun Agrawal, **Patrick Grady**, Irfan Essa, Judy Hoffman, Thomas Ploetz, *Ubiquitous Computing/International Semantic Web Conference (UbiComp/ISWC) 2020*
- *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) 2020*
- *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

Facebook Reality Labs
Research Intern, Nimble VR *Summer 2020*

- Developed contact estimation and optimization methods for high-quality hand object poses

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
- Led two year initiative to push the team past Eco-Marathon competition, to seek and ultimately achieve two World Records
- 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 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

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 6601 - Artificial Intelligence *Fall 2020*
- 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

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

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]