Eric Wallace

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EDUCATION

University of Maryland, College Park — A. James Clark School of Engineering   **GPA:** 3.94/4.00
B.S. Computer Engineering   **GRE:** 170Q, 168V, 6W
Entrepreneurship and Innovation Honors Program   Graduation: Dec 2018

RESEARCH EXPERIENCE

Allen Institute for Artificial Intelligence (AI2) — *Research Intern*   Irvine, CA
Topic: Deep Learning for NLP**, Advisor:** Matt Gardner   *Jan 2019-July 2019*
- Joining AI2 to work on Question Answering, Adversarial Examples in NLP, and Interpretability

University of Maryland: NLP Group — *Undergraduate Research Assistant*   College Park, MD
Topic: Deep Learning for NLP, **Advisor**: Jordan Boyd-Graber   *Jan 2018-Dec 2018*
- Focus on the intersection between Deep Learning and NLP, research topics include:
- Robust NLP systems, models that can handle out-of-domain inputs such as adversarial examples and noisy users
- Interpretation of neural networks and how to properly evaluate interpretability
- Human-in-the-loop ML, models that can learn, interact, and collaborate with humans
- Meta-Learning for NLP, how to quickly adapt models to new domains (low-resource languages, custom users)

University of Maryland: Rotorcraft Center — *Undergraduate Research Assistant*   College Park, MD
Topic: GPU Acceleration of Physics Simulations**, Advisors:** Inderjit Chopra, Ananth Sridharan   *Oct 2016-May 2017*
- Accelerated helicopter physics simulations using GPU parallelism, reached state-of-the-art runtimes for flow field simulation
- Utilized NVIDIA CUDA, OpenMP, OpenACC, and other SIMD/Parallel acceleration libraries (cuBLAS, Thrust)
- Packaged simulator into physics engine currently used at US Army Research Lab for helicopter design and training

NASA: Technology Transfer Research — *Undergraduate Team Lead*   College Park, MD
Topic: Wireless Power for Implantable Devices   *Apr 2016-Nov 2016*
- Led a NASA competition team designing power supplies for implantable medical devices using a piezoelectric film
- Designed system architecture with UMD and NASA researchers, reached competition finals

RELEVANT WORK EXPERIENCE

Lyft, Self-Driving Car Program — *Software Engineering Intern*   Palo Alto, CA
- Developed Deep Learning models for Computer Vision tasks on Lyft's self-driving car team   *June 2018- Aug 2018*
- Reimplemented state-of-the-art CNN models for Binary Semantic Segmentation and Object Detection
- Contributed to vehicle simulation by integrating perception and control systems with physical hardware

Intel — *Software Engineering Intern (Co-op)*   Folsom, CA
- Designed Arithmetic Logic Units (ALUs) for use in the i7/i9 10nm microarchitecture   *Aug 2017- Dec 2017*
- Developed internal testing flow for pre-silicon static power checking for system on a chip (SOC) and ASIC designs

Appian — *Software Engineering Intern*   Reston, VA
- Implemented a ResNet-50 model pretrained on ImageNet for internal image recognition system   *May 2017- Aug 2017*
- Prototyped functionality for sentiment analysis, NER, and topic modeling using Stanford CoreNLP, MALLET, and NLTK
- Modified database query process to dynamically batch data based on available system resources

Textron Systems: UAV Systems — *Computer Engineering Intern*   Baltimore, MD
- Developed C firmware for embedded Microchip PIC32 processor on the Aerosonde UAV   *June 2016- Aug 2016*
- Added voltage/current monitoring circuits and created driver software using peripheral busses (CAN Bus, I2C)

REFEREED PUBLICATIONS

Shi Feng, **Eric Wallace**, Alvin Grissom II, Mohit Iyyer, Pedro Rodriguez, and Jordan Boyd-Graber. Pathologies of Neural Models Make Interpretations Difficult. **EMNLP 2018** (oral). [Paper], [Blog], [Code]

Eric Wallace*, Shi Feng*, and Jordan Boyd-Graber. Interpreting Neural Networks With Nearest Neighbors. **EMNLP 2018 Workshop** on Analyzing and Interpreting Neural Networks for NLP. [Paper], [Blog], [Code]

Eric Wallace, Pedro Rodriguez, Shi Feng, and Jordan Boyd-Graber**. Trick Me If You Can: Adversarial Writing of Trivia Challenge Questions**. Under re-review at TACL**, ACL 2018 Student Research Workshop***, Also appeared in Mid-Atlantic Student Colloquium on Speech, Language and Learning 2018, UMD Undergraduate Research Day 2018*. [Paper], [Website], [Code]

Eric Wallace and Ananth Sridharan. GPU Acceleration of Helicopter Flow Field Simulation. **2018 AIAA SciTech Aerospace Sciences Meeting**. [Paper]

PREPRINTS AND STUDENT EVENTS

[Student Event]: **Eric Wallace** and Ananth Sridharan**. GPU Acceleration of Helicopter Flow Field Simulation. AIAA 2017 Region 1 Student Conference (Best Paper Award)**, Also appeared in *UMD Undergraduate Research Day 2017*.

PROJECTS AND VENTURES

Reimplementation of Deep k-Nearest Neighbors (DkNN) [Original Paper]   *July 2018*
 • Reimplemented the DkNN algorithm, which generates predictions using neural network activations and a k-Nearest Neighbors classifier for adversarially robust and interpretable model decisions

Social Impact Startup - Pinpointer, *Co-Founder and Software Design Lead*   *Jan 2016- Dec 2017*
 • Co-founded a seed funded social impact startup (left to pursue academic research interests)
 • Pinpointer is a crowdsourced application that helps to navigate in developing cities which lack an address system
 • Integrated Google Maps API, OpenStreetMap, and AWS services to collect user data from mobile/web

DeepMind & Blizzard StarCraft A3C Reinforcement Learning Agent   *Aug 2017*
 • Implemented RL agent using Google DeepMind's python API for playing StarCraft II
 • Replicated DeepMind's initial results using policy gradient method (A3C) with ConvNet/LSTM for policy and value network

Motion Planning – ENEE 324: Professor Gilmer Blankenship [Report**] [**Code**]**   *Nov 2016*
 • Developed MATLAB simulation for autonomous cars tasked with communication and self-organization
 • Incorporated physics/dynamics model based on Dubin's Car state space equations
 • Implemented a path tracking navigation algorithm using the pure pursuit method with adaptive look-ahead distance

SERVICE, TALKS, HONORS, AND MEDIA

Service*:* Reviewer for **EMNLP 2018 (Best Reviewer Award)***,* Reviewer for **SemEval 2018**
Talks: EMNLP Oral 2018 — *Pathologies of Neural Models Make Interpretations Difficult (2018)*   Brussels, Belgium
UMD Computer Science Advisory Board — *Generalization in Deep Learning for Language (2018)*   College Park, MD
Adobe Labs Visit at UMD — *Generalization in Deep Learning for Language (2018)*   College Park, MD
Google DeepMind StarCraft AI Workshop — *Learning Macro-Based RL Policies (2017)*   Anaheim, CA
UMD Aerospace Advisory Board — *Computational Methods for Simulating Helicopter Aerodynamics (2017)*   College Park, MD
Academic Awards: National Science Foundation REU Award — *Recipient (2018)*
AIAA Student Conference Best Paper Award – *Recipient (2017)*
Lockheed Martin Corporate Partners Scholarship — *Recipient (2017)*
Yurie/Jeong H. Kim Scholarship — *Recipient (2016)*
Leidos Corporate Partners Scholarship — *Recipient (2016)*
University of Maryland Presidential Scholarship — *Recipient (2014)*
Media Coverage/Outreach: [Blog] [UMD Podcast], [NLP Highlights Podcast], [Quiz Bowl]

TECHNICAL SKILLS & INTERESTS

Software: Python, Java, C/C++, MATLAB **General:** Git, Linux, AWS/Google Cloud
Frameworks: CUDA, PyTorch, Chainer, Scikit-Learn, Tensorflow **Open-Source Contributions:** PyTorch, TorchText, PySC2
Campus Involvement: Technica (largest all-women's hackathon), Machine Learning @ Maryland, Startup Shell, Club Cross Country and Track & Field, Machine Learning Reading Group
General Research Interests: Machine Learning, Natural Language Processing, Reinforcement Learning, Deep Learning