Ellis L. Brown, II | *curriculum vitae*

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Education

Stanford University **Palo Alto, CA**
Non-Degree Graduate Student, Computer Science *2020*
AA222/CS361: Engineering Design Optimization

Columbia University **New York, NY**
Non-Degree Graduate Student, Computer Science *2019*
EECS E6699: Mathematics of Deep Learning

Vanderbilt University **Nashville, TN**
B.S., Computer Science; B.A., Mathematics *2013 – 2017*

Experience

Industry

BlackRock AI Labs
Machine Learning Engineer – Palo Alto, CA *2020 – pres.*
- Building a simulator with realistic models of the securities lending market to optimize and evaluate policies.
- Building a causal model to forecast the effect of a potential fee reduction on inflows for all iShares ETFs.

Data Engineer – New York, NY *2019*
- Built an ETL pipeline and SparkML model to assign decomposable operating event risk scores to all 12k portfolios under management using 3k+ features from around the firm. Project presented to Larry Fink (CEO).

BlackRock
Rotational Software Engineer – New York, NY *2017 – 2018*
- Built a text classifier to identify compliance rules in Investment Management Agreements using OCR and an ensemble of a bag-of-words model and a ConvNet. Previously, 30+ FTEs manually located these rules.
- Built a distributed ETL pipeline for daily mutual fund reference data.
- Built a UI to facilitate the AML/KYC process for new client onboarding.

Software Engineering Intern – New York, NY *2016*
1^{st}, Intern Hackathon – NLP system to extract contract terms from legal documents during new client onboarding.

Research

Artificial Intelligence and Visual Analogical Systems Lab Vanderbilt University
Research Assistant, Prof. Maithilee Kunda's group *2016 – 2018*
- Developed a computational cognitive architecture used to model and understand human visual attention in the context of visual search for a spatiotemporal target (MATLAB).
- Helped create the "Egocentric, Manual, Multi-Image (EMMI)" dataset, containing 6k images each of 360 objects from the viewpoint of toddlers playing with toys, as described in Xiaohan Wang et al. [ICCV-17]

Teaching

Department of Electrical Engineering and Computer Science Vanderbilt University
Teaching Assistant, CS 201: Program Design & Data Structures *Fall 2015*

Open-Source Projects

SSD.PyTorch | GitHub:// amdegroot/ssd.pytorch ★ 4k ⑂ 1.5k *2017*
Co-authored the canonical PyTorch implementation of Single Shot MultiBox Detector, a real-time object detection framework using a single network. [W. Liu et al., 2016]

BNN-Uncertainty | GitHub:// ellisbrown/BNN-Uncertainty *2019*
Keras implementation of a Bayesian Neural Network with dropout
- Examine the effect of weight prior & network architecture on uncertainty estimates.

Name2Gender | *Blog Post* | GitHub:// ellisbrown/name2gender *2017*
Gender Inference from Character Sequences in Multinational First Names
- Implemented Naive Bayes (NLTK) & Char-RNN (PyTorch) approaches

DeepGenres.Torch | GitHub:// amdegroot/deepgenres.torch *2017*
Music genre classification from audio snippets using a ConvNet, built in Torch/Lua.

Awards and Honors

- *3rd Place,* Graduate Student Research Competition, American Indian Science & Engineering Society National Conference, *2019*
- *1st Place*, BlackRock Intern Hackathon, *2016*
- Osage Nation Higher Education Scholarship, *2013 – 2017*
- AP Scholar with Distinction, *2013*
- Academic All-American, USA Water Polo, *2012, 2013*
- National Merit Commended Scholar, *2012*

Extracurricular Activities

American Indian Science & Engineering Society
Mentor, Full Circle Mentorship Program *Spring 2020 – pres.*
Scholarship Reviewer, AISES Undergraduate Scholarship *2020*
Judge, Undergraduate Student Research Competition, National Conference *2019*

Code/Interactive
Mentor to minority high school students interested in technology. *2018*

Vanderbilt Admissions
Tour Guide *2014 – 2016*

Kappa Sigma Fraternity (Kappa Chapter)
Social Chairman, Executive Council *2014 – 2016*

Water Polo
- *Captain & President,* Vanderbilt Club team *2014-16*
- SEC Champions, Vanderbilt Club team *2014*
- Competed in Junior Olympics *2012, 2013*
- Trained in USA Olympic Development Program *2010 – 2013*

Publications

Working (titles and authors may change)

Hristo Paskov, **Ellis Brown, II**. (2020). *A Krylov Method for Fast Parameter Tuning in Ridge Regression*. Unpublished Manuscript, BlackRock AI Labs, Palo Alto, CA.

Journal

Ellis Brown, II, Soobeen Park, Noel Warford, Adriane Seiffert, Kazuhiko Kawamura, Joe Lappin, and Maithilee Kunda. (2018). An Architecture for Spatiotemporal Template-Based Search. *Advances in Cognitive Systems, 6*, 101-118. [paper]

Conference

Ellis Brown, II*, Melanie Manko*, Ethan Matlin*. (2019, Oct. 10). *Modeling Uncertainty in Bayesian Neural Networks with Dropout: The effect of weight prior and network architecture selection*. Abstract and Poster presentation, American Indian Science and Engineering Society National Conference, Madison, WI. (*equal contribution) [poster]

Ellis Brown, II, Soobeen Park, Noel Warford, Adriane Seiffert, Kazuhiko Kawamura, Joe Lappin, and Maithilee Kunda. (2018, Aug. 20). *SpatioTemporal Template-based Search: An Architecture for Spatiotemporal Template-Based Search*. Paper and Oral presentation at the Sixth Annual Conference on Advances in Cognitive Systems, Stanford, CA. [paper, slides]

Ellis Brown, II, Adriane Seiffert, Noel Warford, Soobeen Park, and Maithilee Kunda. (2017, Sep. 21). *Computational Cognitive Systems to Model Information Salience*. Abstract and Oral presentation, American Indian Science and Engineering Society National Conference, Denver, CO. [slides, link]

Reports

Ellis Brown, II. (2020, Jun.). Securities Lending Policy Optimization. Department of Computer Science, Stanford University, Palo Alto, CA. [paper, video]

Ellis Brown, II*, Melanie Manko*, Ethan Matlin*. (2019, May). Modeling Uncertainty in Bayesian Neural Networks with Dropout. Department of Electrical Engineering and Computer Science, Columbia University, New York, NY. (*equal contribution) [paper, slides]