

Ellis L. Brown, II

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Education

Carnegie Mellon University <i>M.S., Computer Science</i>	Pittsburgh, PA <i>2021–Pres.</i>
Stanford University <i>Non-Degree Graduate Student, Computer Science</i>	Palo Alto, CA <i>2020</i>
Columbia University <i>Non-Degree Graduate Student, Computer Science</i>	New York, NY <i>2019</i>
Vanderbilt University <i>B.S., Computer Science; B.A., Mathematics</i>	Nashville, TN <i>2013–2017</i>

Experience

Industry.....

BlackRock AI Labs

Founding team member. Applied machine learning, optimization, & decision theory to strategic projects throughout the firm. Advised closely by [Mykel Kochenderfer](#), [Stephen Boyd](#), & [Trevor Hastie](#). Co-launched the team's [website](#).

Machine Learning Engineer | Palo Alto, CA *2020–2021*

- Open-sourced two Julia packages for separable optimization problems, presented at JuliaCon 2021. [[blog](#), [talk](#)]
- Built a multi-agent simulator of the securities lending market, used it to evaluate and learn lending policies.
- Built a causal model to forecast the effect of a fee change on inflows for iShares ETFs. In use by the pricing team.

Data Engineer | New York, NY *2019*

- Built an ETL pipeline and model in Spark to assign decomposable daily risk scores (denoting the risk of operating events) for all portfolios under management using 3k+ features. Project presented to Larry Fink (CEO).

BlackRock

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 + a ConvNet. Previously, 30+ FTEs manually located these rules.
- Built a distributed ETL pipeline for daily mutual fund reference data.

Software Engineering Intern | New York, NY *2016*

1st, 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, Professor [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 [Wang et al., ICCV-17](#)

Interests.....

Sequential Decision Making • (Deep) Reinforcement Learning • Multi-Agent Systems • AI Safety

Open-Source Projects

JuliaFirstOrder/SeparableOptimization.jl	2021
A Julia package that solves linearly constrained separable optimization problems using ADMM.	
JuliaFirstOrder/PiecewiseQuadratics.jl	2021
A Julia package for manipulation of univariate piecewise quadratic functions.	
amdegroot/ssd.pytorch ★ 4.4k ♡ 1.7k	2017
Co-authored the canonical PyTorch implementation of the Single Shot MultiBox Detector, a real-time object detection framework using a single network. [W. Liu et al., 2016]	
ellisbrown/name2gender	2017
Gender inference from character sequences in multinational first names [blog]	

Awards and Honors

- CS Research Mentorship Program Scholar, Google Research, 2021
- AISES Intel Growing the Legacy Graduate Scholarship, 2021
- GEM Full Fellowship (Declined), The National GEM Consortium, 2021
- 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
- Academic All-American, USA Water Polo, 2012, 2013

Extracurricular Activities

American Indian Science & Engineering Society	
<i>Mentor, Full Circle Mentorship Program</i>	2020
<i>Judge, Undergraduate Student Research Competition, National Conference</i>	2019
Code/Interactive	
<i>Mentor to minority high school students interested in technology.</i>	2018
Vanderbilt Admissions	
<i>Tour Guide</i>	2014–2016
Kappa Sigma Fraternity (Kappa Chapter)	
<i>Social Chairman, Executive Council</i>	2014–2016
Water Polo	
○ <i>Captain & President, Vanderbilt club team (2014 SEC Champions)</i>	2014–16
○ <i>USA Olympic Development Program & Junior Olympics</i>	2010–2013

Publications

Journal.....

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

Conference.....

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

Reports.....

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

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

Talks

- 2021** Linearly Constrained Separable Optimization, JuliaCon 2021 JuMP Track. [[talk](#)]
- 2019** Modeling Uncertainty in Bayesian Neural Networks with Dropout: the effect of weight prior and network architecture selection (poster), American Indian Science and Engineering Society National Conference 2019, Madison, WI. [[poster](#)]
- 2018** SpatioTemporal Template-based Search: An Architecture for Spatiotemporal Template-Based Search, Advances in Cognitive Systems 2018, Stanford, CA. [[slides](#)]
- 2017** Computational Cognitive Systems to Model Information Saliency, American Indian Science and Engineering Society National Conference 2017, Denver, CO. [[slides](#), [link](#)]