

# Ellis L. Brown, II

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## Education

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

*1<sup>st</sup>*, 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

<a href="#">JuliaFirstOrder/SeparableOptimization.jl</a>	2021
A Julia package that solves linearly constrained separable optimization problems using ADMM.	
<a href="#">JuliaFirstOrder/PiecewiseQuadratics.jl</a>	2021
A Julia package for manipulation of univariate piecewise quadratic functions.	
<a href="#">amdegroot/ssd.pytorch</a> ★ 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]	
<a href="#">ellisbrown/name2gender</a>	2017
Gender inference from character sequences in multinational first names [blog]	

## Awards and Honors

- Google CSRMP, Mentee, Google Research, 2021
- GEM Full Fellowship (Declined), The National GEM Consortium, 2021
- 3<sup>rd</sup> Place, Graduate Student Research Competition, American Indian Science & Engineering Society National Conference, 2019
- 1<sup>st</sup> Place, BlackRock Intern Hackathon, 2016
- Osage Nation Higher Education Scholarship, 2013–2017
- Academic All-American, USA Water Polo, 2012, 2013

## Extracurricular Activities

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

## Publications

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### 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

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- 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](#)]