Ryan S. Brill

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Education

University of California, Berkeley *Aug 2016 - May 2020*

- Double Major in Mathematics and Statistics
- Computer Science Minor
- GPA: 3.8

Experience

Honors Thesis, UC Berkeley *Sept 2019 - Present*

- Exploring the intersection of Automatic Theorem Proving and Machine Learning
- Working on a continuation of "Learning Heuristics for Automated Reasoning through Deep Reinforcement Learning", which has found that a combination of Conflict Driven Clause Learning (CDCL) and Graph Neural Networks (GNN) has led to successfully and quickly solving a certain subset of Boolean Satisfiability problems
- Their implementation, however, involves converting a boolean formula to Conjunctive Normal Form (CNF), which shreds the structure of the original formula. So, an interesting question is: can we leverage the structure of the original boolean formula in a GNN, while simultaneously running CDCL on the CNF version of the formula?

RIPS Singapore, National University of Singapore *June 2019 - Aug 2019*

- Research in Industrial Projects for Students (RIPS Singapore) is an REU sponspored by UCLA's Institute of Pure and Applied Math, held at the National University of Singapore, in which students from multicultural backgrounds (Singapore, Vietnam, China, India, and America) are paired with industry sponsors who are working on research projects for their respective companies
- Sponsored by Nvidia, my project was "Exploring a Type-Theoretic Environment for Python"
- Current type-theoretic theorem provers like Coq are robust, but have a steep learning curve and are difficult to use, so Nvidia wanted us to explore creating a type-theoretic theorem proving environment in Python, a ubiquituous language with a lower learning curve
- Created a prototype Python library, wrote a report which we gave to our sponsor at Nvidia, gave a presentation to the NUS math community, and will give a presentation at the Joint Math Meetings Conference in Denver in January 2020

UC Berkeley Mathematics Directed Reading Program *Jan 2019 - June 2019*

- Learned about Brownian motion (including proofs of its construction, almost-sure continuity, and nowhere differentiability), the Ito Integral, Ito's product rule, Ito's Chain rule, Existence and Uniqueness theorems, its connection to finance, and most interestingly, its connection to PDEs (for instance, certain PDEs involving the Laplacian have stochastic solutions)
- Read Lawrence Evans' "An Introduction to Stochastic Differential Equations" with a mathematics PhD candidate who studies PDEs and probability
- Wrote a Beamer presentation summarizing the field of SDEs, and gave a presentation to the Berkeley math community

UC Berkeley Neuroeconomics Lab - *Research Assistant* *Jan 2018 - Dec 2018*

- Assisted Haas professor and psychology Ph.D. candidate with study to understand how the brain computes and represents values that allow an individual to make his economic decisions
- Built and maintained a Pygame program, used in conjunction with a dynamometer, to present participants with incentivized (paid) choice dilemmas and measure their reactions

Calhat Enterprises - *Co-Founder* *Aug 2016 - May 2018*

- Created "Calhat," a "street" hat brand marketed to university students with branches at 5 universities: "Calhat" (UC Berkeley), "Statehat" (San Diego State), "Cusehat" (Syracuse), "Slughat" (UC Santa Cruz), and "Wildhat" (Chico State)
- Found and engaged supplier in China through Alibaba to manufacture thousands of hats
- Led guerilla marketing/branding campaign

Stout Risius Ross, LLC - *Summer Intern* *June 2018 - Aug 2018*

- Worked in the Complex Securities Valuation group of global valuation advisory firm
- Studied theoretical foundations of options pricing
- Valued the carried interest of a hedge fund invested in a leading ride-share app
- Valued the earnout of an acquisition of one healthcare company by another

Programming Skills

Python, R, Java, Swift, Excel, Github, LaTeX

Awards

Regents' and Chancellor's Scholarship, UC Berkeley *Aug 2016 - Present*

Awarded UC Berkeley's most prestigious scholarship for undergraduates in recognition of academic and personal achievements, such as being valedictorian, captain of varsity tennis, and my commitment to community service.

Extracurricular Interests

Fantasy Football, Sports Betting, Producing Rap Instrumentals,
Mathematics Undergraduate Student Association, Mountain Biking, Texas Hold'em