NEYMIKA JAIN

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EDUCATION

California Institute of Technology - Applied + Computational Math (ACM) *2017 - 2019, 2021 - Present*

Teaching Assistant: Introduction to Computer Programming (CS 1), Applied Linear Algebra (ACM 104)

Relevant Coursework: Advanced Topics in Machine Learning (CS 159), Numerical Optimization Methods (ACM 213), Machine Learning Systems (CS156ab, CS 155), Statistical Inference (ACM 157)

The Harker School *September 2014 - May 2017*

DECA, FRC Entrepreneurship Award, TEAMS Nationalist, State Science Fair Award Overall GPA: 4.3

National Toxicology Conference Presenter and ASIO Best Abstract Award Winner

TECHNICAL STRENGTHS

Computer Languages	Python, C#, MATLAB, C++, OCaml, R, Octave, Julia, Git, Java
Software & Tools	PyTorch, TensorFlow, GitHub, Visual Studios, Docker, LaTeX, Excel, Mathematica

EXPERIENCE

Caltech May 2022 - Present

Arthur Adams SURF Fellow

- Implemented 4 **stochastic optimization** methods for convex problems. Determined best performance with 99.9% **loss reduction** and 10 fewer iterations.
- Improved performance by 20% on strongly convex problems by applying **multifidelity principles** to aforementioned stochastic optimization method under Dr. Elizabeth Qian and Dr. Pan Xu. Presenting at Caltech Fall Seminar 2022.

Microsoft June 2018 - September 2020

Summer Software Engineering Intern

- Developed a new cognitive skillset which **identifies 15 phrase categories** and **reshapes 10K+ enriched documents** according to user inputted shaping as part of Azure Data R&D Analytics PM team.
- Added 3 **character distance measures** that could improve text recognition in written documents by 60% as part of the Cognitive Search team in Applied AI within an open source Power (Custom Web API based) Skill on GitHub.
- Improved conversational ability by 20% for the Financial Support assistant using language understanding services (LUIS) and developing **an Entity recommendation algorithm** for previous queries.

Stanford June 2015 - March 2017

Research Intern

- Under Dr. Daniel Rubin, created **a semi-automated scorer** better than 5 competitors with 98% accuracy for HER2 immunohistochemistry images using LASSO and SVM **regression analysis**.
- Under Dr. Kaustubh Supekar, used **large 2K+ longitudinal dataset** to classify with 80% accuracy the role of APOE- $\varepsilon 4$ on cognitive impairment using Support Vector Machine (SVM), Random Forest, and Naive Bayes **classification analysis**.

FIRST Robotics August 2013 - May 2017

Executive Managing Director, VP of Software

- Presented weekly reports to Board of Directors, **managed over 40 students**, and planned events for 500+ FIRST members.
- Used HSL-based blob-finding algorithms for **object identification** in images. Used convex hull and Jarvis march algorithms to refine object boundaries by 35% and selection for **autonomous robot vision**.

COLLEGE PROJECTS & EXTRACURRICULARS

ACM Thesis Project June 2022 - Present

- Researched occurrence of frequency, or spectral, bias and implicit regularization in neural networks.
- Determining reason why frequency and rank biases occur in neural networks under Dr. Anima Anandkumar and Dr. Jiawei Zhao.

Computer Science Thesis Project April 2022 - Present

- For 6 weeks in CS159, implemented **generative models** using **machine learning** for different music genres with 75% internal classification accuracy.
- Developing AI Jazz tool, an **autonomous classifier** and accompaniment generator, under Dr. Austin Minnich.

Financial Analysis Software January 2021 - Present

- For personal portfolio, developed **data analysis** tools in OCaml and outperformed 6 common market indices by over 30%.
- Currently, using **A/B testing** with 5% of my portfolio to compare profits between my **semi-autonomous trading** and my trading.

Conferences & Volunteering: Tapia 2022, GROW 2022, Caltech Y Rise Tutor, Hacktech Organizer + Volunteer