Elaine Liu

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Education

Massachusetts Institute of Technology **Sep. 2020 – May 2024**
Bachelor of Science in Mathematics with Computer Science. GPA: 5.0/5.0 *Cambridge, MA*

Relevant Coursework: Design and Analysis of Algorithms, Intro to Machine Learning, Probability, Theory of Computation, Real Analysis, Abstract Algebra (I & II), Multivariate Calculus, Intro to Embedded Systems

Technical Skills

Python, Tensorflow, Java, LaTeX, Statistical Analysis, Probability

Experience

MIT D-Lab **Sep. 2021 – present**
Undergraduate Researcher at Mobile Technology Lab *Cambridge, MA*

- Build a supervised machine learning model to predict stress level from heart signals.
- Extract meaningful features to improve performance.

Media Lab **Sep. 2020 – August 2021**
Undergraduate Researcher at Personal Robotics Group *Cambridge, MA*

- Developed an automatic suicide risk evaluation system using statistical analysis and feature selection.
- Extracted, cleansed, and analyzed real-world raw eye and head movement data from videos.
- Identified the top 12 facial bio-markers of suicide risk to be used in clinical settings ($> 97\%$ accuracy with MLP and SVM classification, far exceeding the 42.4 % in similar studies).
- Collaborated with a partner using Git and first-authored conference paper to be submitted to AAAI-22.

Honors and Achievements

European Girls' Mathematical Olympiad: Bronze Medalist (2019), Honorable Mention (2020)
Math Prize for Girls Olympiad: Silver (2019), Bronze (2018) Medalist
United States of America Junior Mathematical Olympiad: Qualifier (2018)

Projects

Linguistic Sexism in the Gaming Community | *Python, OCR, Sentiment Analysis* **August 2019 – May 2020**

- Conducted ethnographic data collection to record interaction among *League of Legends* players.
- Documented text-based conversations using Optical Character Recognition techniques.
- Constructed context-specific dictionary and computed sentiment of each line of exchange.
- Evaluated levels of linguistic sexism among players of different ranks using ANOVA and T-tests.
- Paper published in *The Young Researcher* in August 2020.

Curling Stone Trajectory Analysis | *Personal Project* **Feb. – May 2019**

- Modelled trajectories of different curling shots and analyzed the effects of sweeping with data collected on ice.
- Achieved 95% accuracy under near-ideal scenarios.

Political Language Analysis | *Appleby College* **April – June 2019**

- Quantified and established correlation between linguistic complexity and political tendency in a news article.

Leadership and Extracurricular

Next House Social Committee, MIT Undergraduate Association, MIT Rocket Team, Stanford University Math Camp (SUMaC 2019), Canada/USA Mathcamp 2018