

Roma Bhattacharjee

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PERSONAL STATEMENT

I am a freshman at Princeton University having graduated from the University of Chicago Laboratory High School, where I was a member of the science, math, robotics, and volleyball teams, as well as Student Council. I have been most passionate about computers, programming, and robotics and have been exploring its interdisciplinary applications. I also enjoy solving Project Euler, USACO, and Google Code Jam problems in my spare time.

Standardized Test Scores: SAT 1590/1600 [Aug '20], ACT 36/36 [Dec '19], PSAT 1500/1520 [Oct '19], National Merit Scholarship 2021 Finalist: 224/226, 2021 Semifinalist for U.S. Presidential Scholars Program, SAT Math 2: 800, SAT Physics: 790, AP French: 4, (AP Computer Science, AP Calculus BC, AP Physics 1, AP Physics C: Mechanics): 5

Software Skill Sets

MacOS, Windows, Linux/Unix, C/C++, Java, Python, Bash, HTML, JavaScript, PHP, Swift, React, Node.js, LaTeX, MySQL, PostgreSQL, Firebase, Excel, NumPy + Pandas, MATLAB, Fusion360, Blender, Flask, PyQt5, Tensorflow, Apache Web Server, Kafka, InfluxDB, Grafana, Docker

EXPERIENCE

Applied AI/ML at UChicago SAND Lab, Chicago, IL

Summer Research assignment [June 2021 – August 2021]

- ❖ Selected for a research internship at the University of Chicago SAND Lab (Security, Algorithms, Networking, and Data) through the Center for Data & Computing (CDAC) Summer Lab program. I worked with Professor Ben Y. Zhao.
- ❖ Conducted research on physical backdoor attacks in computer vision models. Developed an automated process using graph analysis techniques to uncover viable physical triggers in pre-existing object datasets for training.

Computer-aided Diagnosis: Machine Learning/AI at UChicago Giger Lab [\[Link\]](#), Chicago, IL

Summer Research assignment [June 2020 – June 2021]

- ❖ Worked with Dr. Karen Drukker, Dr. Deepa Sheth, and Ms. Lindsay Douglas (PhD candidate) on project about quantitative radiomic analysis for abbreviated/ultrafast breast MRI. Radiomics is high throughput conversion of images to mineable data that can be viewed as descriptors of tumors and “normal” tissue.
- ❖ First author of a research abstract accepted to Optics and Photonics organization SPIE's Medical Imaging Conference, February 2021 - delivered an oral presentation. Project involved comparing breast lesion segmentation methods, some of which utilized convolutional neural networks.

COVID Alliance [\[Link\]](#), Chicago, IL

Software Engineering Volunteer [April 2020 – February 2021]

- ❖ A not-for-profit organization connecting governments, public health organizations, and health care providers with best-in-class experts across science, policy and technology.
- ❖ Assisted in software engineering: extract/transform/load data processes (Airflow, PostgreSQL), Django development

Carbonless Community [\[Link\]](#), Chicago, IL

Chief Technology Officer [May 2019 – June 2021]

- ❖ A group that assists communities in taking easy and thoughtful measures to reduce their carbon footprints.
- ❖ Assisted in conducting reverse auction for renewable energy and carbon offsets

Citadel LLC [\[Link\]](#), Chicago, IL

Intern at Equities Data Engineering Team [Jun 2019 – Aug 2019]

- ❖ Developed usage tracking architecture. Built “milestone” dashboard to track ETL processes. Gained experience with Kafka, Postgres, REST APIs, Flask, Airflow, Grafana, InfluxDB, and Docker
- ❖ Delivered a “lunch and learn” talk on Kafka to the department
- ❖ Evaluation/feedback from my manager: *“What makes Roma stand out is her willingness to take on something unknown and her ability to learn it through doing research ... Her willingness to take on a new problem where she lacks the domain knowledge and build that knowledge without hesitation will make her an exceptional engineer in the future.”*

Self-Directed Programming Projects

- ❖ **JavaScript**
 - Multiplayer Ultimate Tic Tac Toe game with Node.js and Socket.io (for fun)
 - Hackathon (“HackNow”) competition: real-time lists with Node.js and Firebase
- ❖ **Python**
 - Automated trade execution application with PyQt5 (for a client)
 - Personalized debate timer application with PyQt5 (for my debate team)
 - Handwritten digit classifier with TensorFlow (for fun)

EDUCATION

Princeton University, Princeton, NJ

Freshman, Class of 2025

- ❖ Pursuing B.S.E. degree with intended concentration in COS/ORFE and certificate in OQDS
- ❖ Member of Princeton Debate Panel, software engineer on The Daily Princetonian Tech Team, and member of Princeton Women in Entrepreneurship

University of Chicago Masters Program in Computer Science (MPCS), Chicago, IL

Non-degree-seeking high school student

- ❖ Courses: iOS Application Development (Grade: A); Algorithms (Grade: A); Introduction to Software Engineering (Grade: A)

University of Chicago Laboratory Schools, Chicago, IL

Class of 2021, GPA UW 4.0/4.0

- ❖ Brian Swan award for AT Physics I (awarded to student who best demonstrates mastery of material and an excellent teaching ability)
- ❖ Achievement in Computer Science award
- ❖ Eunice Helmkamp McGuire Excellence in Writing award, Finalist
- ❖ Partial list of courses: AT Physics I & II; Biology; AP Computer Science; Computer Architecture; Discrete Mathematics; Artificial Intelligence & Machine Learning; Independent study in Structuralism & Semiotics; AT Economics; Linear Algebra/Multivariate Calculus
- ❖ Member of Science, Math (qualified for AIME 2020, 2021), Robotics, and F1 in Schools teams; 1st place in Regionals Academic Challenge Computer Science
- ❖ Executive Board of Student Council (Director of Technology), debating team (Novice), Vice-President of Girl-Up Club, Varsity Volleyball (Co-Captain), Board of Artsfest, and tutored a middle school student

Latin School of Chicago, Chicago, IL

JK through 8th grade, Class of 2021, GPA 4.0/4.0

- ❖ Highest GPA award; Science award; Isabelle W. Lawrence Humanities award
- ❖ Member of Math team, Science Olympiad team (team captain), robotics club.

SUMMER CAMPS & EXTRACURRICULARS

Johns Hopkins CTY Summer Program — Fundamentals of Computer Science, Intensive Study Course [2017]. Co-wrote a walkthrough guide that explained concepts of a programming library we explored in class. Instructor used it to teach peers and future students.

Summer Institute for the Gifted — Macroeconomics, Surgery, Pre-Calculus, Art of Propaganda [2018]

Music — Piano since 4 years of age. Completed all 12 levels of the Achievement in Music (AIM) program.