Roma Bhattacharjee

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PERSONAL STATEMENT

I am a freshman at Princeton University having graduated recently 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 from an early age and have been exploring its interdisciplinary applications. I also enjoy solving Project Euler, USACO, and Google Code Jam problems in my spare time, as these challenge my mathematical and algorithmic thinking.

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 Computer Science: 5, AP Physics 1: 5, AP Calculus BC: 5, AP French Language & Culture: 4, AP Physics C: Mechanics: 5

EXPERIENCE

Applied AI/ML at UChicago SAND Lab, Chicago
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
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
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
Chief Technology Officer [May 2019 – June 2021]

- A group that assists like-minded 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
Intern at Equities Data Engineering Team [Jun – 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

University of Chicago Masters Program in Computer Science (MPCS), Chicago
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
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)
- Eunice McGuire English 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, F1 in Schools, and Varsity Volleyball 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, Board of Artsfest, and tutored a middle school student

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

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

SUMMER CAMPS

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

I have been playing the piano since I was 4 years old. I have completed all 12 levels of the Achievement in Music (AIM) program. I have also played the trombone in the school band from 9 years of age.