Viraj Singh

▪ **E-mail**: v@virajsingh.com ▪ **Website**: http://www.virajsingh.com ▪ **AI & ML Club**: https://mlphs.github.io

Academic Profile

Princeton High School, Princeton, NJ Class of 2023
Unweighted GPA: 4.0; Weighted GPA: 4.61/4.0
ACT: 35 (Composite) (Reading: 36; English: 34; Math: 35, Science: 35)

AP Courses & Scores: AP U .S. History (Score: 5), AP Calculus BC (Score: 5), AP Computer Science A (Score: 5), AP Physics I (Score: 5), AP World History (Score 5), AP Spanish, AP Physics C, AP Statistics

Post AP Courses: Multivariable Calculus/Linear Algebra, Data Structures & Algorithms, Sociology Accelerated

Technical Skills: Java, Python, Algorithms & Data Structures.

Under the guidance of Mrs. Graciela Elia (My PHS Computer Science teacher), I have prepared a lesson and a couple of videos to help fellow PHS students and the internet community understand one of the hard concepts on Floating Point Numbers, loss of precision in Floating Point arithmetic and recursion in Computer Science.
PDF: https://viraj-vs.github.io/docs/computer-science/floating-point/Floating_Point.pdf
Youtube: https://www.youtube.com/watch?v=u8WjMyR6Xh4&t=2s

Proficient in Languages: English, Spanish, Hindi, Punjabi

Honors

- First place in Science Olympiad (Astronomy) in New Jersey state competition (2022).
- AP Scholar with Distinction

Extra Curricular Activities

Academic

RESEARCH :

Independent Research through Polygence **Summer 2022 - Present**

- I am researching if the sentiment towards law enforcement (police) has changed over time in pop culture. I have used the rap lyrics dataset, Machine Learning, Natural Language Processing, and Sentiment Analysis to find if there is a positive or negative association with law enforcement and how it has changed over the last few decades.
  Tools used: Python, Java, Google Collab
- Working on a paper in the area of my research above for the Regeneron Science Talent Search

Princeton High School Research Program (Selected as a sophomore) **2020 - Present**

- I read research papers, write literature reviews, and explore the scientific method. For example, I read papers from N-Dimensional Manifolds to the immune system about COVID-19 and neutrophils.
- DNA extraction of the isopods to classify and discover new species.
- Collaborating with the scientists from Princeton Neuroscience Institute to simplify published scientific papers and make them available to school children

STEM ACTIVITIES:

PHS Machine Learning and Artificial Intelligence Club, Founder and President **2021 - Present**

- I have created this club to Introduce high schoolers to Artificial Intelligence & Machine Learning concepts, bridge the gap between theory and practice, and actively discuss ethical AI.

- Developed a multi-lesson curriculum and hold lessons every week on Supervised Learning, The Perceptron, Neural networks, Unsupervised Learning, Reinforced Learning, and NLP. The details are at https://mlphs.github.io/
- Developed several projects using Google Colab to allow club members to apply theory to practice. For example, I created a project where students trained a neural network on handwritten digits. Each student handwrote digits and then experimented to see how well the model classified these digits.

HackPHS, Director - AI for social good (https://hackphs.tech/**)** **2021 - Present**
- Designed and led a neural networks workshop during the hackathon.
- Constructed a panel of judges for the hackathon to judge the hackathon projects for the HackPHS AI for the social good award.

PHS Science Olympiad, Captain (Astronomy) **2020 - Present**
- 1st place at State Tournament (2022)
- Other Events: Ornithology, Experimental Design, Sounds of Music (Physics and Music)

Bridge USA, Officer. **2021 - Present**
- I lead lunchtime discussions of political and social issues such as abortion, gender privilege, gun control, the role of government, and unitary executive theory. Goal to have open and honest discussions, Socratic style, about controversial topics.

PHS Philosophy Club **2020, 2022**
- Pursued Philosophy interest by watching YouTube videos and reading lecture series throughout the summer

Community Service

STEM ROOTS (LINC Leader) **2021 - Present**

STEM Roots' goal is to ignite a passion for STEM and literacy among children while breaking stereotypical barriers, e.g., socio-economic situation, race, and gender.
- I have been selected as a LINC leader, once in my Junior year and now in my Senior year, to lead a group of high school students to teach STEM topics to underprivileged children at the Henry Pannell Center.
- Teach in a fun way by creating and conducting hands-on experiments based on STEM topics.
- During the pandemic, I created a virtual version of the program. Worked with the school, coordinated with the program director, sent the materials to the children every week, and conducted virtual experiments via Zoom to continue to fuel the passion for STEM.

Community Park Elementary School STEM Expo **2021 - present**
- Taught 250 children about the Immune System using an interactive game of tag to simulate an infection. Explained how bodies fight off infection and why vaccines keep people healthy.

Performing/Visual Arts

PHS Classic Films Club, Officer **2021 - 2022**
- Watched and analyzed Classic films, primary 1950s and French New Wave
- The movies highlighted were The Godfather, Some Like It Hot, Breathless, Dr. Strangelove, Airplane, The Naked Gun, Birdcage, Casablanca, The Mirror, etc.

Writing a Movie:
- Co-wrote a film with a fellow high school friend, Luca Balescu, titled "Noise."
- Played a role in the film

Music Appreciation: Listening to albums, analyzing lyrics, searching for different production elements

OTHER SKILLS/INTERESTS

Hobbies: Pencil collection, Biking, Piano, Stand-up Comedy fan