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# MEERA RAY

## EDUCATION

### Carnegie Mellon University

B.S. Statistics & Machine Learning,

Minor: Literature and Culture

(US News Ranking #1 in Artificial

Intelligence, #2 in Computer

Science, #5 in Statistics)

### Mission San Jose High School

(US News Ranking #8 in

California High Schools, in Top

1% Nationally)

## TEST SCORES

GRE: Quant: 164/170,

Verbal: 165/170,

Analytical Writing: 5.0/6.0

SAT: 1570 (E:790; M:780)

SAT II Math: 800

Advanced Placement (AP):

Physics: 5/5, Statistics: 5/5,

Computer Science: 5/5,

Chemistry: 5/5,

Calculus AB: 5/5

## AWARDS

2022: NSF Summer REU

Funding Stipend

2018: National Merit

Scholarship Finalist

2017: Google CodeCorps

SuperStar Award (Most

Enthusiastic Volunteer)

## SUMMARY

Curious, driven student skilled in the application of machine learning to novel problems

## SKILLS

- **Languages:** R, Python, HTML/CSS, JavaScript, SQL, Java
- **Repository:** [github.com/meeraray](https://github.com/meeraray)
- **Data Science:** Fundamental calculus, statistics and linear algebra that power ML algorithms i.e. supervised vs unsupervised learning, hypothesis testing, backpropagation, gradient descent; data modeling; effective visualizations; model diagnostics and evaluation
- **Libraries & Tools:** NumPy, SciPy, scikit-learn, Matplotlib, Tidyverse, GGplot, GLM
- **Algorithms:** Multiple linear regression with transformation and interaction, General and Robust Linear Models, classification, nonparametric models
- **Innovation under Pressure:** Experience with Carnegie Mellon University Hackathons

## COURSEWORK

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|---|---|
| • Algorithms and Advanced Data Structures | • Methods for Statistics and Data Science |
| • Text Analysis                           | • Matrix Algebra with Applications        |
| • Advanced Methods of Data Analysis       | • Multivariate Analysis                   |
| • Intro to Machine Learning               | • Writing About Data                      |
| • Modern Regression                       | • AP Computer Science                     |
| • Statistical Graphics and Visualization  | • AP Statistics                           |
| • Statistical Computing                   | • Intro to C++                            |
| • Principles of Imperative Computation    | • Discrete Math                           |

## PROJECTS AT CARNEGIE MELLON UNIVERSITY (CMU) / SELF STUDY

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### Eye Tracking Keyboard: [Team Repository](#)

January 2022

At Tartan Hacks (Carnegie Mellon University's biggest hackathon), my team created a keyboard operated by looking at the screen. I used computer vision libraries, JavaScript, and HTML/CSS.

### Predicting Patient Satisfaction: [Full Report \(PDF\)](#)

December 2021

Trained a logistic and forest classifier on asthma patient data using Tidyverse and ggplot in R to predict patient satisfaction. Causal inference techniques used, gleaned insights from exploratory data plots.

December 2021

### Customer Personality Analysis: [Online Version](#), [Full Report](#)

Used data visualizations with GGplot and statistical tests in R to analyze the behavior of customers based on demographics and purchasing behaviors. I produced Research Question 1 in a collaborative final project for my Statistical Graphics and Visualizations class.

November 2019

### Predicting Dress Sales with Machine Learning

<https://drive.google.com/file/d/1nwPIIc3AA0lOn9pE5QeTKwtjomAH6go0/view?usp=sharing>

Using machine learning algorithms, analyzed data from retailers to predict which dresses should be put on sale based on the characteristics of each dress. Wrote a paper for Methods of Statistics and Data Science course at CMU.

### Wallpaper Changer, <https://github.com/meeraray/wallpaper-changer>

Sep 2018 - January 2020

Created and deployed a Python desktop application to change the wallpaper at sunset and sunrise, which varies based on time of year and location. Integrated multiple libraries with Windows system, troubleshooted, and created user-friendly GUI and installer application.

### 2D Obstacle Game, <https://github.com/meeraray/apcs-project>

May 2019 - June 2019

Along with one other teammate, created a 2D obstacle video game in Java for my AP Computer Science class. Designed the game, pitched idea and planned, and learned the Java Lightweight Game Library. Far surpassed the requirements of the academic project.

### Node Graph Maker, <https://github.com/meeraray/node-graphs>

July 2019 – Aug 2019

Created a GUI with HTML/CSS and JavaScript to make and edit a graph of interconnected nodes. Visualization to show depth-first shortest path algorithm between two points.

## EXPERIENCE/LEADERSHIP ACTIVITIES

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### Summer Researcher – Northwestern University

Jun – Aug 2022

- **8-week Research Fellowship.** Participated in Quantitative Biology Research Experience for Undergraduates, an NSF-funded program at Northwestern University's NSF-Simons Center for Quantitative Biology. Mentored by [Dr. Auffinger](#), I investigated the role of noise and signal in UMAP, a dimension reduction algorithm commonly used in single-cell RNA visualizations. I presented my results in a symposium attended by faculty and graduate students.

### **Web Developer – Research Project at CMU**

Mar – May 2022

- **Created a website** for CMU's Human-Computer Interaction Institute. Part of project team at CMU and UT Austin examining the impact of AI on COVID essential workers. I developed an HTML/CSS and JS front-end and Python Flask backend, as well as thorough documentation.

### **Summer Intern - Undergraduate Research Apprenticeship at CMU**

May – July 2021

- **Data Visualization & Statistical Tests.** Under the mentorship of a statistics professor at my university, I worked with my teammates to examine the impact of sanctions on various countries through data visualizations using Tidyverse and GGPlot in R.

### **Head of Student Affinity Group at CMU**

August 2020 – ongoing

- **Organized and led** group meetings, solved community problems

### **Summer Intern** *DeAnza College, Computer Science Dept.*

Summer 2018

- **Created Resources on “Artificial Intelligence for Lawmakers”:** Worked with De Anza University Professor.

### **Web & Software Development Summer Camp** *Zenith Prep. Academy,*

Summer 2016

- **Gained real-world development skills:** Created a professional-quality website with HTML, CSS, JavaScript, PHP, and SQL

## **VOLUNTEER EXPERIENCE/ADDITIONAL ACTIVITIES**

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### **Students Using Data Science for Social Good**

2019

Worked with CMU staff in the CREATE Lab to create a data visualization tool to represent the effect of mass incarceration on American society, with the goal of advocating justice reform. Used web scraping tools and Python libraries to extract and analyze data.

### **Volunteer Teacher, Google CS First – Boys & Girls Club of Silicon Valley**

2015 - 2017

Helped teach kids in a lower-income neighborhood the basics of computer science, including drafting and presenting supplementary instruction and helping with debugging (Guru Position)