

Jacob Shin

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Education

Temple University Bachelor of Science in Physics Cumulative GPA: 3.93 out of 4.00	Philadelphia, PA, United States	Aug 2020 - May 2024
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Research Experience

Undergraduate Research Assistant Department of Physics Water Science Research Group Advisor: Dr. Xifan Wu	Temple University	August 2022 - Present
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- Currently analyzing density functional theory (DFT) simulation data to determine the role Van Der Waals forces play in water's unusual properties (e.g. negative thermal expansivity and density maximum at 4 °C)
- Processed 5 Terabytes of raw simulation data on a high performance computing cluster by vectorizing computations and using parallel processes

Undergraduate Research Assistant Department of Physics	Temple University	December 2021 - May 2022
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- Simulated the interactions of particles (e.g. electrons and protons) with detectors of different geometries and analyzed the resulting interactions using C++

Undergraduate Research Assistant Department of Computer Science	Temple University	January 2021 - May 2021
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- Implemented a web program to interface with the IoT (Internet of Things) devices to detect anomalies that could indicate security concerns in a smart home
- Navigated a codebase with over 40k lines of code and added 10k lines of code

Work Experience

Amazon Software Development Engineer Intern	Seattle, WA	May 2022 - Aug 2022
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- Created a Machine Learning (ML) Platform to automate the process of securely transferring ML data.
- Created a query API to filter through 10 terabytes of data using Typescript and Java

Security Innovation, Inc. Security Engineer Intern	Seattle, WA	June 2021 - Aug 2021
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- Wrote and reviewed 20 reports detailing the scope and severity of the vulnerabilities in code and recommended remediation steps
- Conducted independent research exploring the security of platforms using the ez80 CPU and presented it to the company

Princeton Plasma Physics Lab Intern	Princeton, NJ	Oct 2019 - Dec 2019
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- Created schematics for a Langmuir probe, which is used to measure plasma properties such as temperature and density based on the I-V (Current-Voltage) curve.
- Performed component selection for the Langmuir probe based on the specifications of the plasma parameters and the signal filtering requirements.

Skills

Programming Languages/Frameworks: Python, Jupyter Notebooks, Mathematica, Matlab, C, C++, Javascript

Markup Languages: \LaTeX , Markdown, HTML, CSS

Programming Tools Linux, Bash, Git/Github, Vim, SSH/SCP

Other Multisim, Soldering, Basic Machine Shop Training

Human Languages: English

Activities

- **Temple Robotics** - Contributed to the code base for the robot to be used in the NASA Robotics Mining/Lunabotics Competition and operated the mill in the machine shop to create components
- **Temple Data Science Club** - Created challenge problems for students to learn programming and computer security
- **Temple Physics Club** - Member
- **Schuylkill Center Wildlife Clinic** - Volunteer (2021-2022)

Awards and Honors

- **Temple Presidential Scholarship** - Full Tuition Merit Scholarship for 4 years
- **Science Scholars Program** - Selective research program that offers a \$4,000 stipend per summer for research
- **Temple Dean's List** - Granted to the top 16% of students: Fall 2020, Spring 2020, Fall 2021
- **Philly Codefest American Water IoT Prize** - Won \$1000 in prizes for the best IoT electronics and coding project
- **Temple Honors Program** - Selective program for high-achieving students which offers advising and advanced honors level classes

Courses

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| • Analytical Mechanics | • Physics 1 & Physics 2 |
| • Optics | • Real & Complex Analysis I |
| • Principles of Electric Circuits | • Basic Concepts (Intro to Proofs) |
| • Introduction to Modern Physics | • Differential Equations with Linear Algebra |
| • Mathematical Physics | • Calculus III (Multivariable and Vector Calculus) |
| • Thermal Physics | • Computer Systems and Low Level Programming |
| • Electricity and Magnetism | • Data Structures |
| • Scientific Computing III | • Mathematical Concepts in Computing I (Discrete Mathematics) |
| • Classical Mechanics | |