

# Jacob Shin

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## Education

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

## Research Experience

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**Undergraduate Research Assistant** **Temple University** August 2022 - Present  
Department of Physics  
Water Science Research Group  
Advisor: Dr. Xifan Wu

- 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** **Temple University** December 2021 - May 2022  
Department of Physics

- 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** **Temple University** January 2021 - May 2021  
Department of Computer Science

- 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

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**Amazon** **Seattle, WA** May 2022 - Aug 2022  
Software Development Engineer Intern

- 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.** **Seattle, WA** June 2021 - Aug 2021  
Security Engineer Intern

- 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** **Princeton, NJ** Oct 2019 - Dec 2019  
Intern

- 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

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

**Markup Languages:**  $\text{\LaTeX}$ , Markdown, HTML, CSS

**Other:** Linux, Bash, Git/Github, Vim, SSH/SCP

**Laboratory Skills:** Multisim, Soldering, Basic Machine Shop Training

**Human Languages:** English

## Activities

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- **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

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- **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
- Optics
- Principles of Electric Circuits
- Introduction to Modern Physics
- Mathematical Physics
- Thermal Physics
- Electricity and Magnetism
- Scientific Computing III (Intro to Machine Learning)
- Classical Mechanics
- Physics 1 & Physics 2
- Real & Complex Analysis I
- Basic Concepts (Intro to Proofs)
- Differential Equations with Linear Algebra

- Calculus III (Multivariable and Vector Calculus)
- Computer Systems and Low Level Programming
- Data Structures
- Mathematical Concepts in Computing I (Discrete Mathematics)