Alexander Joukov

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Work Experience

Software Engineering REU Intern at Carnegie Mellon University *May 2024 - present*

- Analyzed 60k+ python git commits using Sourcegraph's **GraphQL API** to build a comprehensive datetime bug benchmark suite. Produced a bug-detection program using **CodeQL** to identify unstable code patterns and automatically generate pull request patches. Presented poster.

REU Fellow at Stony Brook University *Nov 2023 - present*

- Built an I/O scheduler in the **Linux kernel** to prioritize fast block device requests, reducing average latency and thereby enhancing system responsiveness and disk performance on many machines.
- Developed a **machine learning** model to predict I/O request latencies with high accuracy.
- Utilized **red-black trees** for I/O re-ordering and **spinlocks** for **thread-safe synchronization**.

Software Engineer at ModelizeIT Inc. *Nov 2021 - Apr 2024*

- Created a **back-end** storage system that packages user queries like **regular expressions** and feature matching into **JSON**, **CSV**, or **SVG** files.
- Developed a **JavaScript** library for customizable tables with dozens of functions for modifying and querying data, streamlining numerous analytical tasks.
- Designed an account generation program and analyzed email verification data using **NumPy** to reveal a security flaw in 70% of the leading US websites, resulting in a publication in HAISA'23.

Research Assistant at Stony Brook University *May 2023 - Jul 2023*

- Computationally analyzed single-cell RNA sequencing results, resulting in a publication in JID'24.

Education

Stony Brook University - Honors College - 4.0/4.0 GPA - Dean's List - 1560 SAT *May 2026*

- Bachelor of Science in Computer Science and Applied Mathematics and Statistics.
- Honors Computer Science Scholarship (2024): awarded to the **number one** student annually.
- Honors Algorithms: **Ranked 1st** of 63; *only* student to receive a perfect final exam score that year.
- Honors Math for Computer Science: **Ranked 1st** of 73; 1 of 3 to *ever* receive a perfect test average.
- Honors Data Structures and Algorithms: **Ranked 1st** of 65.
- Probability and Statistics: **Ranked 1st** of 180.
- System Fundamentals, Computational Geometry, Computer Science A & B
- Teaching Assistant for Graduate Algorithms; teach **greedy**, **DP**, **probabilistic** & **graph algorithms**.

Projects

- **Parkara:** Developed a parking availability app using **React**, **MongoDB**, and **Heroku** to provide a real-time heatmap of urban street parking based on historical crowdsourced user contributions.
- **DareFlix:** Developed a Netflix extension using **React** and **OpenAI Whisper** to detect keywords. **Awarded 2nd** place of the Creativity category at HopperHacks 2024 with 400 participants.
- **3D Engine:** Used **Java** and **linear algebra** for perspective calculation, ray-tracing, object collisions, and runtime optimizations, resulting in efficient 3D rendering performance.

Skills

C/C++, Shell script, JavaScript, Java, Python, Git, Linux, SQL, Docker, AWS, Tensorflow, Pandas, NumPy, PyTorch, HTML, TailwindCSS, Node.js, Flask