ALEXIS LE GLAUNEC

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EDUCATION

Rice University | *Houston, TX* Jul 2025
PhD in Computer Science GPA: 4.0/4.0

Institut Polytechnique de Paris | *Paris, France* Jul 2021
MS in Computer Science GPA: 4.0/4.0

TECHNICAL SKILLS

Programming: Rust, Python, Java, C/C++, CUDA, SQL, Javascript, PHP, Bash, R, HTML
Tools: Git, Docker, Kubernetes, AWS, Apache ZooKeeper, Java EE, Redis, gdb, TensorFlow
Skills: Unix, REST APIs, Scripting, Multithreading, Operating Systems, Computer Architecture, Containers

RELEVANT PROJECTS

Energy and Memory efficient ASIC for Regex Matching - Rice University, *Houston, TX* April. 2022 - Now

- Implemented and benchmarked an ASIC simulator in **Rust**, accelerating by x100 upon the previous **Python** implementation
- Reduced the energy consumption by up to 93% and area by up to 64% with this new **ASIC** design

GPU-Accelerated Multi Pattern Matching - Rice University, *Houston, TX* Feb. 2022 - Now

- Implemented a massively parallel algorithm in **Rust** and **C++** for regex matching on GPU with **CUDA**
- Improved upon the state-of-the-art with a 50x speedup over applications for protein search, malware and spam detection

Regex Engine Using Bit Vector Automata - Rice University, *Houston, TX* Jan 2022 - Oct 2022

- Programmed a high performance SIMD-accelerated regex matcher in **Rust** 100x faster than concurrents for regexes with counting
- Benchmarked against state-of-the-art Grep, PCRE and RE2; the matcher outperformed them by 1000% with a matching time below 1 second for 99% of regexes

Hardware-Software Co-Design for Regex Matching - Rice University, *Houston, TX* Aug 2021 - Nov 2021

- Implemented **static analysis** in **Java** to save memory on matching regular expressions with repetitions; approximated the static analysis, reducing the running time by x100 for difficult regexes
- Collaborated with the hardware team to create an **ASIC** specialized hardware for regex matching, achieving 76% energy savings and 58% area reduction on hardware thanks to static analysis in Java

WORK EXPERIENCE

GPU Research Intern
Thales | *Palaiseau, France* Feb 2021 - Jul 2021

- Overhauled parallelization of a ray tracer on GPU in **Python** by redesigning algorithms and improving data locality; reduced the running time by 20 times from 10 hours to 30 minutes
- Introduced continuous integration and rigorous tests, helping to find 10+ bugs
- Proposed a multi GPUs parallelization by connecting 2 GPUs, achieving a near-perfect 197% speedup

Security Software Intern
Unumkey | *Reims, France* Jun 2019 - Jul 2019

- Engineered a scalable and secured dockerized Capture The Flag platform handling 50+ containers using **Flask** for the frontend, **Docker** and **Kubernetes** for the backend to train programmers on **cybersecurity**
- Awarded a $600 prize for exceeding the internship's expectations

SELECTED PUBLICATIONS

A. Le Glaunec, L. Kong and K. Mamouras. *Regex Engine Using Bit Vector Automata*, **OOPSLA**, 2023
L. Kong, Q. Yu, A. Chattopadhyay, **A. Le Glaunec**, Y. Huang, K. Mamouras, and K. Yang. *Software-Hardware Codesign for Efficient In-Memory Regular Pattern Matching*, **PLDI**, 2022