Micah Kepe

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Education

Rice University Aug 2022 – Dec 2025
Bachelor of Science in Computer Science *Houston, TX*
GPA: 3.89/4.00

Experience

Undergraduate Research Assistant Intern May 2025 – Dec 2025
Rice University *Houston, TX*

- Advised by Dr. Konstantinos Mamouras; Designed high-performance streaming algorithms in Rust for querying semi-structured data (e.g., JSON) using finite automata techniques.
- Achieved 86–95% faster performance over leading JSON query tools by compiling queries into optimized state machines.
- Built and benchmarked throughput-optimized pipelines processing 100+ MB/s, significantly improving memory efficiency vs. offline and traditional methods.

Machine Learning Research Intern Feb 2024 – Aug 2024
Vislang Lab *Houston, TX*

- Advised by Dr. Vicente Ordóñez-Román; Co-led the development of a 40M+ image repository for open-source research, enabling the development of advanced multimodal datasets for ML applications.
- Implemented and evaluated CLIP-based models for zero-shot image classification, reproducing state-of-the-art results on ImageNet without task-specific fine-tuning.
- Built infrastructure tools for dataset annotation, visualization, and semantic search (e.g., Whoosh indexing, Faiss-based retrieval), enabling scalable exploration of a 100M+ image-text corpus.

Software Development Intern Jun 2023 – Aug 2023
King Energy *Durango, CO*

- Designed and deployed an automated legal document bundling and tagging system, cutting manual processing time by 30% for the legal team.
- Developed a RESTful backend service integrating Node.js, Salesforce API, and Google Drive API, enabling real-time synchronization between CRM project stages and legal workflows.

Projects

Vimtutor Sequel | *Bash, Vimscript, Ruby, Homebrew*

- 500+ GitHub stars, featured on the front page of Hacker News, and successfully packaged into Homebrew-Core for streamlined installation and use by thousands of developers worldwide.
- Designed and authored 8 advanced Vim tutorials covering macros, registers, and plugin development, significantly expanding learning resources for power users.

jsongrep | *Rust, Automata Theory, Language Design*

- Designed a JSON query language and engine delivering sub-20 ms search times on 500MB+ documents.
- Outperformed popular tools (e.g., `jq`, `JSONPath`) by optimizing query compilation into automata-based search.

OwlDB NoSQL Database | *Go, Concurrency, REST API, Skiplist Indexing*

- Built a modular, real-time NoSQL database engine in Go, featuring Server-Sent Events (SSE) for live document subscriptions and updates, JSON schema validation, token-based authentication, and a PATCH system with optimistic concurrency control and atomic operations.
- Engineered a concurrent skiplist indexing layer with lazy synchronization, hand-over-hand locking, and atomic pointer operations—enabling efficient, thread-safe queries and updates.

Technical Skills

Languages: Rust, Go, Python, Java, JavaScript/TypeScript, C, SQL, R
Frameworks: React, Node.js, Flask, Next.js
Developer Tools: Git, Docker, AWS, Google Cloud Platform, Neovim, PostgreSQL
Machine Learning: PyTorch, TensorFlow, Computer Vision, NLP, NumPy, pandas