Jake Kasper

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Skills

Programming Languages: C, x86-64, AArch64, RISCV, CUDA, Python, Java, LaTeX
Frameworks and Libraries: PyTorch, TensorFlow, Numpy, Pandas, Bash
Developer Tools: Git/GitHub, GDB/LLDB, Valgrind, QEMU, GNU Make
Technologies: Operating Systems/Kernel Development, Large Language Models/Neural Networks

Experience

Waites Sensor Technologies | *Machine Learning Engineer* March 2025 - Present

- Collaborated on a statistics and machine learning based diagnostics system for categorizing machine health
- Assumed sole leadership of a computer vision machine maintenance system, and delivered and end to end edge-computing pipeline achieving high 90% accuracy using convolutional neural networks
- Contributed to development and maintenance of large-scale web applications, including database migrations and improvements, front-end development, and back-end modifications
- Presented and built new architecture allowing for write-safe operations to production-mirrored environments for improved automated testing

Pfizer | *Data Science and Advanced Analytics Intern* June 2023 - August 2024

- Collaborated in a multinational team to apply cutting-edge research in causality and disentangled deep learning to plan, design, and implement custom neural network models for the purpose of analyzing chemical compounds and their effects on cells
- Designed and implemented a multi-threaded Python framework to evaluate and compare accuracy and latency of large language model metrics
- Presented findings and recommendations to company leadership

University of Pittsburgh School of Computing and Information | *Teaching Assistant* August 2022 - December 2024

- CS 0449 - Introduction to Systems Software (Spring 2023, Fall 2024)
  Lectured and supervised projects pertaining to C programming, x86-64 assembly, allocators, and virtual memory
- CS 1501 - Algorithms and Data Structures 2 (Fall 2023, Spring 2024)
  Proctored recitations and debugged Java projects surrounding trees, heaps, graphs, and search/compression algorithms
- CMPINF 0401 - Intermediate Programming (Fall 2022)
  Proctored labs teaching Java and the fundamentals of object-oriented programming

SparkNeuro | *Data Science Intern* May - August 2021, May - August 2022

- Created a Python library to convert EEG data into spectral images for convolutional neural network classification tasks
- Authored a paper proposing a new set of proper data separation techniques when evaluating neural networks

Projects

rpos – Bare-Metal ARM Kernel | *C, AArch64 Assembly* | github.com/jbkasper5/rpos

- Built a bare-metal kernel from scratch for the Raspberry Pi 4B (BCM2711), including bootloader and UART driver bring-up validated on physical hardware
- Implemented virtual memory with a high-half kernel / low-half user address space split, backed by a buddy allocator and a slab allocator for `kmalloc`
- Wrote an ELF loader and primitive `fork`/`exec` with copy-on-write page semantics
- Implemented ext4 filesystem parsing and a round-robin process scheduler

Education

University of Pittsburgh December 2024
Bachelor of Science in Computer Science, Summa Cum Laude *GPA: 3.95/4.0*
Minor: Mathematics

Relevant Coursework: Operating Systems, Advanced Systems Software, Compilers, Computer Vision, Machine Learning, Deep Learning, Multivariable Calculus, Optimization, Algorithms and Data Structures, Linear Algebra, Cryptography and Network Security

Awards: Dean's Honor List (Fall 2021 through Fall 2024), Steelhacks Hackathon Winner (2022)

Publications

Brookshire, G., Kasper, J., Blauch, N. M., Wu, Y. C., Glatt, R., Merrill, D. A., Gerrol, S., Yoder, K. J., Quirk, C., & Lucero, C. (2024). Data leakage in deep learning studies of translational eeg. *Frontiers in Neuroscience*, *18*.