Jakob Nordhagen

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EDUCATION

Stanford University

B.S. Computer Science (Systems & ML), graduating 2024

Relevant Coursework

- Computer Networking
- Parallel Computing
- Operating Systems Programming
- Applied Matrix Theory
- Machine Learning
- Linear Algebra and Multivariable Calculus
- Artificial Intelligence: Principles and Techniques
- Data Management and Data Systems
- Design & Analysis of Algorithms
- Deep Learning for Computer Vision

SKILLS

- **Programming Languages:** Python, C++, C, JavaScript, TypeScript, CUDA, SQL, Swift (familiar), Go (familiar), HTML, CSS
- **Tools and Technologies:** Git, MERN stack, Google Colab/Jupyter Notebooks, AWS, PyTorch, TensorFlow

EXPERIENCE

Private Academic Tutor – *Self-employed* November 2020 – Present

- Taught material, explained concepts and led exercises on a frequent basis, focusing on mathematics, writing, and test preparation.
- Achieved significant improvements in performance and confidence for multiple clients.

Student Office Assistant – *Hume Writing Center* September 2022 – Present

- Managed scheduling and execution of hundreds of tutoring appointments according to clients' matriculation status and subject matter.
- Communicated with professors, students, and colleagues about workshop requests, student inquiries, and appointment scheduling issues.

PROJECTS

Building the Internet – *Course project* March 2023 – June 2023

- Developed significant portions of the Internet TCP/IP software in C++, resulting in a custom network stack that can communicate with others.
- Implemented the bytestream, the TCP sender/receiver components, the network interface, and the IP routing mechanism.

Pintos Operating System – *Course project* January 2022 – March 2022

- Developed an operating-system kernel in C, as part of Stanford's OS course (CS 140).
- Drastically improved thread functionality by implementing a priority-based scheduler and a multi-level feedback queue scheduler.
- Added support for executable user programs, implemented 14 core system calls, and implemented full thread-safe concurrency.
- Implemented virtual memory, a filesystem buffer cache, an indexed inode scheme, and file extensibility.

Accurate Handwriting Transcription using Deep Learning – *Project/publication* September 2022 – December 2022

- Iterated and trained CRNN models for handwriting text recognition using Python and TensorFlow, as part of Stanford's ML course (CS 229).
- Successfully improved word accuracy from our 73% baseline to 85%, and decreased character error rate from 11% to 8% on the test set.
- Co-authored a published paper in a team of 3, which discusses model architecture, related literature, our methods, and adjustments.

Social Network App – *Course project* March 2022 – June 2022

- Wrote a full-stack social web application using the MERN stack as part of Stanford's web applications class.
- Implemented more than 95% of layout, UI, and core features using JavaScript, HTML, CSS, React, NodeJS, Express, and MongoDB.
- Implemented support for posting photos, comments, likes, and saving photos to favorites.

Stanford Shell – *Course project* May 2020

- Built a fully functional shell program in C as part of Stanford's computer systems course (CS 107).
- Implemented program execution, job management, pipelines, and input/output redirection.

Photo Wars – *Collaborative project* April 2023 – June 2023

- Ideated, iterated, and developed a fully featured web application from scratch using TypeScript and the MERN stack.
- Worked with 4 other Stanford students using the Git workflow, brainstorming ideas, delegating tasks, collecting community feedback, and building features into a real product.
- Presented at Stanford's annual software fair.