Levi Neuwirth

CURRICULUM VITAE · Last updated May 2026

ln@levineuwirth.org · +1 (845) 332-0898 · levineuwirth.org · ORCID: 0009-0002-0162-3587 · Forgejo: git.levineuwirth.org/neuwirth · GitHub: github.com/levineuwirth

EDUCATION

Technical University of Denmark (DTU)

September 2026 – expected 2028 · Kongens Lyngby, Denmark

MSc in Computer Science and Engineering.

Primary advisor and research group TBD. Intended path toward PhD upon completion.

Brown University

August 2022 – May 2026 · Providence, RI

Sc.B., Mathematics and Computer Science. GPA 3.8/4.0.

Primary undergraduate advisor: D. Ellis Hershkowitz (Computer Science). Primary research supervisor: Liqi Shu, MD (Neurology, Warren Alpert Medical School).

DIS Copenhagen / Københavns Universitet

Fall 2024 · Copenhagen, Denmark

Semester abroad.

RESEARCH EXPERIENCE

Shu Laboratory, Brown University Department of Neurology — *Undergraduate Researcher and Technical Lead*

October 2023 – Present · Providence, RI

Research with Dr. Liqi Shu spanning clinical machine learning, movement-disorder kinematic analysis, and claims-based outcome prediction. Two distinct research threads:

- Technical lead on **NeuroPose**, a 3D pose-estimation and kinematic-analysis system for neurological-recovery research. Built end-to-end pipeline: Python/TensorFlow deep-learning inference, MATLAB statistical post-processing, Rust backend with HTML/JS frontends. System supports four externally-funded sub-projects; clinical-implications manuscript in preparation.
- Co-lead developer on an **order-invariant ICD-10-CM embedding model** for 30-day readmission (AUC 0.75 vs 0.66 CCI baseline) and postdischarge mortality prediction (AUC 0.86 vs 0.78), Deep Sets architecture trained on 113M+ adult hospitalizations from the HCUP Nationwide Readmissions Database. Preprint under review at *JAMA Network Open;* public calculator deployed at levineuwirth.github.io.

Brown University Center for Computation and Visualization (CCV) — *Independent Researcher (HPC-supported)*

March 2025 – Present · Providence, RI

- Micro-architectural study of SIMD contributions to lattice-based post-quantum cryptography (ML-KEM / Kyber) on x86-64 AVX2, conducted on Brown's OSCAR HPC cluster with staff support. Phase 1 released as a technical report (see Publications); Phase 2 (hardware performance counters, RAPL energy) and Phase 3 (cross-ISA: ARM NEON/SVE, RISC-V V) in progress.

PUBLICATIONS AND PREPRINTS

Equal-contribution undergraduate authors are marked with †.

Shu L, Neuwirth L†, Wang X†, Zheng H†. *Beyond Comorbidity Indices: An Order-Invariant ICD-10-CM Embedding for Readmission and Mortality Prediction.* Under review at *JAMA Network Open*. [Preprint] [Code] [Calculator] 2026.

Neuwirth L. *Where Does SIMD Help Post-Quantum Cryptography? A Micro-Architectural Study of ML-KEM on x86 AVX2.* Technical report, Brown University Department of Computer Science. [Report] [Artifact] 2026, April.

NeuroPose clinical-implications manuscript. In preparation. Shu laboratory, Brown University Department of Neurology. Target venue TBD, 2026–2027.

PRESENTATIONS

Shu L, Neuwirth L†, Wang X†, Zheng H†. *Order-Invariant ICD-10-CM Embedding for Readmission and Mortality Prediction: Toward Multimodal Generative Patient Models.* IEEE/ACM Conference on Connected Health: Applications, Systems and Engineering Technologies (CHASE), 2026. Submitted; under review.

Ma J, Arms S, Kaneira L, Lall M, Chen K, Cabral W, Man D, Neuwirth L, Shu L. *Early Detection of Neurological Disorders through Video-Captured Kinematic Analysis.* Poster presentation, Summer UTRA Symposium, Brown University / Rhode Island Hospital Neurology Department, August 2025.

GRANTS AND AWARDS

Brown Undergraduate Teaching and Research Award (UTRA), individual recipient. Summer 2024.

First funding awarded for NeuroPose; the work has since attracted three additional project-wide grants through the Shu laboratory.

Graduate fellowship / admissions awards at DTU.

Pending; updates as they land.

RESEARCH AFFILIATIONS

NSF Award #2148451 — A Learning Ecosystem for Teaching High School Students Machine Learning Concepts and Data Science Skills in Healthcare and Medicine — *Undergraduate mentor / research affiliate*

October 2023 – May 2025

Affiliated with an NSF-funded education research project studying how high-school students learn machine learning and data science concepts in a healthcare and medical context. Contributed in a college-student mentor capacity; not an author on the study's research outputs. Independent of the Shu laboratory research.

SYSTEMS AND ENGINEERING PROJECTS

Weenix *January 2025 – Present*. Full Unix-like kernel in 10,000 lines of C: virtual memory, VFS, system calls, threading, device drivers and interrupt handlers, and file systems with custom linker support for running userspace x86-64 ELF binaries. Brown CS 169.

Networking Stack from Scratch *October 2024 – July 2025*. TCP/IP, RIP, UDP, and DNS implementations in Go, supporting file transmission of up to 1 GB across networks of up to 8 virtual machines.

INDUSTRY EXPERIENCE

xAI

May 2025 – August 2025 · Remote

Contributed to the training of `grok-code-fast-1`, xAI's agentic coding model (publicly launched August 2025).

- Architected LLM integrations into autonomous agent frameworks, orchestrating 20 tools across thousands of production workflows and codebases.
- Diagnosed and resolved 50+ agentic failures, lifting tool-execution success rates by 15%+, cutting fatal tool-usage errors by 40%+, and reducing API usage by 20%+.

NeuroAI LLC — *None*

March 2026 – Present · neuroai.health

Early-stage venture of academics and clinicians integrating deep learning, reinforcement learning, and generative AI into clinical and research workflows. Leading model development, deployment infrastructure, and system design.

SELECTED CONTRACT WORK

Independent Research Contracting — Anthropic, OpenAI, Mistral. 2025 – Present, as-needed.

Code and mathematics contributions for agentic workflow design, task evaluation, model safety, and red-teaming.

LANGUAGES

English native · Spanish C1 · Danish B1 · German A2 · Chinese (Mandarin) A2 · French A1.

TECHNICAL SKILLS

Programming: Assembly (x86-64, inline SIMD), C, C++, C#, Go, Java, JavaScript, Python, Rust.

ML and AI: PyTorch, TensorFlow, NumPy, Pandas, OpenCV.

Tools and platforms: Git, LaTeX, Linux (Arch, Debian, Gentoo), make, SLURM, perf, Docker.

RESEARCH INTERESTS

Artificial intelligence and machine learning; reinforcement learning; deep learning; clinical and biomedical ML; computer systems; cryptography; high-performance computing; computer vision; computer architecture; security