

Denny Schaedig

Machine Learning Engineer

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SUMMARY

ML Engineer who designs, trains, and ships production ML systems end-to-end from data pipelines and distributed training to model packaging, serving, and deployment. Published researcher (Neurophotonics, 2025) with hands-on ownership of cloud HPC and self-hosted multi-GPU infrastructure. Experienced across generative models, deep learning, and LLM / agentic systems.

SKILLS

Languages: Python, Go, TypeScript / JavaScript, SQL, Dart, C++, Bash

Machine Learning & Deep Learning: Generative AI (GANs, diffusion models), Transformers / attention, CNNs, RNNs, computer vision (object detection), speech & audio (Whisper, TTS), multimodal fusion, reinforcement learning, transfer learning

LLMs & Agents: Agentic AI, RAG (pgvector, sentence-transformers), hallucination detection & LLM evaluation, local inference (llama.cpp, CTranslate2), Anthropic & OpenAI APIs, LangChain

Frameworks & Libraries: PyTorch, TensorFlow / Keras, Hugging Face Transformers, Ultralytics YOLO, MMDetection, OpenCV, scikit-learn, XGBoost, SciPy, statsmodels, pandas, spaCy

Model Distribution & Serving: Hugging Face Hub (models & datasets), TensorFlow Lite (on-device), ONNX Runtime, vLLM, Ollama, FastAPI inference APIs

Code Distribution & CI/CD: PyPI packaging (hrfunc, pymaxim), GitHub Actions, pytest, ruff, mypy, uv

Infrastructure & MLOps: AWS (EC2, Lambda, S3, EFS, Glacier), Docker / Compose, Kubernetes, Ray, CUDA, Weights & Biases, PostgreSQL, Redis, Prometheus, OpenTelemetry, Cloudflare, Tailscale, Vercel

Web & Apps: FastAPI, Flask, React, Next.js, Astro, Flutter

Neuroimaging & Signals: MNE / MNE-NIRS, Nilearn, NiBabel, NeuroKit2, fMRI, fNIRS, physiological signals

PROJECTS

- **HRfunc** - Open-source Python package for hemodynamic signal deconvolution with a live peer-to-peer HRF-sharing database; published in Neurophotonics (2025) and demoed in an invited NIRx vendor webinar. hrfunc.org
- **Maxim** - Bio-inspired cognitive architecture for LLM agents (PyPI: pymaxim, Apache-2.0) providing homeostatic drives, persistent cross-session memory, reward learning, and RAG, with a simulation environment and robotics integration. pymaxim.bio
- **snowGAN / Rocky Mountain Snowpack** - Curated 4,040-image CV dataset and pretrained GAN released on Hugging Face (DOI 10.57967/hf/6143); used as a transfer-learning backbone for avalanche-risk classification. rmdig.ai

EXPERIENCE

Laboratory for Child Brain Development — Washington University in St. Louis

Machine Learning / AI Engineer

St. Louis, MO

Dec 2022 – Present

- Architected a HIPAA-compliant AWS HPC environment (EC2, EFS, S3, Glacier) ~32% under projected cost and secured an additional 24% university-wide cloud discount.
- Designed and shipped **HRfunc**, an open-source, pip-installable Python package for signal deconvolution; published in Neurophotonics (2025), presented in an invited NIRx vendor webinar, and maintained across 22 public releases (~14K PyPI downloads).
- Trained **NIRSGen**, a diffusion model trained from scratch on biomedical time-series for data augmentation; validated via transfer learning, lifting downstream classification accuracy to 92% (vs. 76% randomly reinitialized).
- Built **BOLDnet**, a TensorFlow framework with custom spatial-attention layers and 4D volumetric data loaders for rapid model prototyping on standardized datasets.
- Developing **synchronAI**, a multimodal deep-learning AI fusing video, audio, and time-series signals for automated inference (0.72 AUC) (github.com/dennys246/synchronAI).

Rocky Mountain Digerati, LLC

Founder

Summit County, CO

Nov 2025 – Present

- Built a healthcare-finance analyst agent with a novel hallucination detection and removal layer, running on open-weight models as small as 16B parameters.
- Operate a heterogeneous multi-node inference cluster (Ray, mixed CUDA and Apple Silicon backends, Tailscale mesh) for local training, evaluation, and model serving.
- Curated and published a 4,040-image computer-vision dataset on Hugging Face (peak of ~2,600 monthly downloads) for avalanche-risk modeling.
- Generatively pre-trained snowGAN (PyTorch / TensorFlow) on high-resolution snowpack imagery, released to Hugging Face (RMDig/snowGAN-core & RMDig/snowGAN-magnified-profile), and transferred into a downstream multimodal avalanche-risk classifier (AvAI).
- Built the AvAI cross-platform mobile app to serve real-time model inference and collect labeled field data.
- Developed the federated server AvServ for orchestrating the check-out safety program, enabling AvAI app users to directly connect to search and rescue teams when they do not check-in at an expected time.

The Pain Lab — University of Colorado Boulder

Software / ML Engineer

Boulder, CO

Jul 2020 – Feb 2023

- Trained an RNN to predict pain levels from wearable-sensor and questionnaire data (79% accuracy vs. 63% majority-class baseline).
- Built ETL pipelines moving and preprocessing data from remote servers and devices into a relational SQL database, time-aligning multiple physiological streams for ML training.

Intermountain Neuroimaging Consortium — University of Colorado Boulder

Software Engineer

Boulder, CO

Jul 2017 – Feb 2022

- Built ETL pipelines and automation for MRI scheduling, study enrollment, and training-compliance, improving recruitment throughput and data availability.

PUBLICATIONS

Graff, K., Zhang, Y., **Schaedig, D.**, Melhem, N., & Perlman, S. B. *Stability of the functional connectome across childhood: A five-year dense-sampling case study with multi-subject validation*. NeuroImage (2026).

doi.org/10.1016/j.neuroimage.2026.122246

Rocha-Hidalgo, J., Nguyen, H., Reis, D., **Schaedig, D.**, Thompson, K. I., Perlman, S. B., & Pérez-Edgar, K. E. *Parent-child neural dynamics during a stressful task: Probing associations with temperament and anxiety*. Clinical Psychological Science (2026).

doi.org/10.1177/21677026251396786

Thompson, K. I., Zhang, Y., **Schaedig, D.**, Bankston, A., Parnerkar, A., Jeyaram, S., Melhem, N., & Perlman, S. B. *Identifiable regional and neural network abnormalities in early childhood anxiety*. JCPP Advances (2026).

doi.org/10.1002/jcv2.70158

Schaedig, D., Schumer, M., Mata-Centeno, B., Pollonini, L., Pérez-Edgar, K., Melhem, N., & Perlman, S. B. *HRfunc: A tool for modeling hemodynamic response variability in fNIRS*. Neurophotonics (2025).

doi.org/10.1117/1.NPh.13.S1.S17801

Alvarado, C., Panlilio, C. C., Pérez-Edgar, K., Thompson, K. I., **Schaedig, D.**, Melhem, N., & Perlman, S. B. *Neural synchrony in parent-child dyads*. bioRxiv (2025). doi.org/10.1101/2025.07.02.662817

EDUCATION

M.S., Artificial Intelligence & Machine Learning - Colorado State University Global

2025

B.A., Neuroscience - University of Colorado Boulder

2019

CERTIFICATES & AWARDS

- Stanford Online - Algorithms: Divide & Conquer / Sorting & Searching; Graph Search, Shortest Paths & Data Structures.