JAKE VIKOREN

Machine Learning Engineer

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Skills

Research & Development, Engineering, Leadership, Technical Communication, Strategy, Applied Mathematics

Tools

Python, PyTorch (Lightning), AWS, NumPy, OpenCV, HDF5, Dask, Hydra

Projects

Brain Tumor Segmentation

Strategic Innovation Group

I designed and implemented a self-supervised hybrid quantum-classical contrastive learning architecture for efficient brain tumor segmentation.

Skin Cancer Classification

https://www.kaggle.com/code/jvikoren/fastai-mobilenet-90-acc

I created a supervised learning model in PyTorch to classify the cell type of skin lesions. I utilized transfer learning, selective data augmentation, and custom learning rate cycling to achieve state of the art performance.

Summary

Physics-trained Machine Learning Engineer with 5+ years of experience in deep learning with an emphasis on scientific computing for physical systems. Proven track record collaborating with cross-disciplinary teams to develop ML solutions at scale. Dedicated to untangling the mysteries of biology to understand and overcome disease.

Experience

2022 - 2025

Machine Learning Researcher @ Quantum Generative Materials

Developed and applied structure-property generative models to accelerate materials discovery. Created robust pipelines for handing Terabytes of 3D and 4D data. Led patent development, ML model advancement, and coordinated with lab researchers.

2021 - 2022

Machine Learning Engineer @ Booz Allen [Strategic Innovation Group]

Co-lead of the applied quantum research group, implementing hybrid quantum-classical ML solutions for brain cancer MRI analysis. Synthesized and presented advanced quantum and ML offerings to stakeholders and prospective customers.

2020 - 2021

Data Scientist @ Eonum, Inc.

Leveraged quantum machine learning algorithms for applications in carbon capture technology. Assessed data for quality measures such as completeness, accuracy, and applicability. Performed EDA and composed beautiful reports summarizing outcomes.

Publications

2024

Machine Learning, Density Functional Theory, and Experiments to Understand the Photocatalytic Reduction of CO2 by CuPt/TiO 2

Designed and applied a custom machine learning interatomic potential fine-tuned for a unique material system. Improved mechanistic understanding of the photocatalytic reduction of CO2 for transformation into value-added hydrocarbons.

2023

Generation of Thermodynamically Favorable Crystal Structures of Pb_{10-x}Cu_x(PO4)6O using Atom Combinatorics Approach

Applied DFT to investigate the structural and electronic properties of Cu-substituted lead apatite (LK-99), evaluating its stability and potential superconducting behavior.

Education

2012 - 2017

University of Santa Barbara
Bachelor's in Physics, Minor in Philosophy

Biophysics, Cell Biology, Quantum Mechanics, Thermodynamics, Solid State Spectroscopy, Vector Calculus, Linear Algebra, Differential Equations, Statistics, Relativity, Ethics, Critical Thinking, Metaphysics, Modal Logic, Philosophy of Science

2014 - 2015

Tohoku University
Visiting Researcher, Quantum Optics

Accepted into an undergraduate research program. Performed quantum optics experiments with Master's and PhD students including entangled photon generation, single photon generation, weak measurement, quantum state tomography and more.