

Andy Franck

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EDUCATION

Occidental College - *B.A. Mathematics, B.A. Computer Science, B.A. Physics* Jun 2027

Portland State University - *Concurrent Enrollment During High School* Aug 2023

- **Relevant Coursework:** Data Structures, Algorithms, Vector Calculus, Advanced Linear Algebra, Discrete Math, Abstract Algebra/Group Theory, Differential Equations, MATLAB Programming/Numerical Methods, Data Modeling with SQL, Information Theory, Dynamics, Math Methods in Physics, Physics/Dynamics Simulations
- **Graduate Coursework:** Mathematics of Machine Learning, Theory of Deep Learning, Numerical Optimization

EXPERIENCE

Lead Developer of Independent IP: Machine Learned Detection of a Baseball Pitcher's Tell Jun 2023 - Present

- Developed custom, recurrent neural networks in Python: PyTorch for model creation. High-dimensional calculus and linear algebra used to display the model's methods for prediction (guided backpropagation).
- Utilized Pandas to format data. Created function to decrease data loading time by 75%.
- Employed NumPy, SciKit-Learn, and Torchvision libraries to artificially increase dataset size 200+%.
- Used communication skills and networking to obtain optimum video training data from SCIAM college baseball team. Worked with pitchers, coaches and administrators to obtain a 250+ element video training set.

Lead Developer & Founder: Team Strand Game Studio Dec 2021 - May 2022

- Winner of Regional Oregon Game Project Challenge. Led development of a Unity-based, cooperative, mountain climbing video game, *Roped Together*, with over 300 visitors and players. Developed custom physics engine for 3D rope model, employed Blender for models/animations, and logic trees for shared inventories.
- Git and GitKraken used for version control and weekly sprints. 100+ Trello notes, meetings, and stickers.
- Mentored teammates in Unity, C#, and Git. Used communication skills to delegate tasks and resolve conflicts.

PROJECTS

[Custom Deep Learning Library in NumPy](#) Jan 2023 - May 2023

- Used Python/NumPy to develop custom deep learning library "MyTorch", which operates and calls functions analogously to PyTorch. Developed custom MyTorch loss functions, optimizers using stochastic gradient descent, and forward/backward passes. Created functioning convolutional, recurrent, and regular neural networks.

[Human Eye Ultrasound Analysis & Pathology Detection by Neural Networks](#) May 2023 - Jul 2023

- Developed multi-output convolutional neural network to analyze ocular ultrasound images, with shared and independent layers based on GoogLeNet model. Leverages image augmentation to inflate dataset size 150%.
- Supports novel neural networks method in diagnostic ultrasound. Wrote publication draft in LaTeX.

[Forecasting Geothermal Power Plant Feasibility with Machine Learning](#) Mar 2023 - May 2023

- Developed ML model in Pytorch to predict geothermal heat flow residuals based on 28 feature dataset.
- Updated project to analyze topographical maps with convolutional neural network model. Accurately predicted geothermal heat flow residuals with a 77% binary classification accuracy. Utilized Pandas and Seaborn libraries to analyze and format professional dataset provided by the United States Geological Survey.

[Personal Portfolio Website Development](#) Jun 2023 - Aug 2024

- Created personal portfolio website to showcase projects and experience with Next.js, TailwindCSS and Vercel
- Deployed personal askAndy chatbot that utilizes the OpenAI API and stores chat logs on a MongoDB server.

TECHNICAL SKILLS

- Python, C++, C#, C, SQL, Java, JavaScript, Linux/Unix, Bash, Mathematica, MATLAB, LaTeX, Git, GitKraken
- NumPy, Pandas, Keras, PyTorch, Matplotlib, SciKit-Learn, Torchvision, Seaborn, Vercel, TailwindCSS, Trello