# Jackson Newman

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## Work Experience

**AMD** **San Jose, CA**
Software Engineer Intern, Internal Development Tooling June 2023 - September 2023

- Accelerated Vivado constraint processing by 50% with a new C++ pattern matching function.
- Developed unit tests achieving 100% coverage to ensure performance and accuracy for Wildcard Matching.
- Reduced Vivado memory usage by 2% by refactoring code to utilize Tessil C++ Hash map package.
- Automated memory, encryption tests, and key upgrades using Python, cutting testing time by 50%.

**Shellie.us** **San Francisco, CA**
Full Stack Software Engineer Intern, MERN Stack June 2022 - September 2022

- Developed a React-based hierarchical UI with dynamic modals and edit functionality for exhibits.
- Created REST API integrations for editing and saving exhibit data in the NoSQL backend database.
- Created reusable React components, improving maintainability and reducing development time by 30%.
- Used React and Redux for state management, enhancing data consistency and reducing errors by 20%.

## Projects

**AI Model Demonstration Wesbite** | *Flask, AWS, GCP, LLM, REST API*

- Configured and deployed 3 AWS EC2 Linux VMs for AI model performance testing and benchmarking.
- Benchmarked Llama.cpp and vLLM server with LLMPerf to determine the fastest LLM inference on CPU.
- Improved Stable Diffusion performance with NNCF quantization, cutting image generation time by 80%.
- Deployed an end-to-end Flask web app with Nginx to showcase OpenAI-like LLM inference via HTTP.
- Developed a Flask API server capable of handling hundreds of image generation requests.

**TinyGPT** | *Python, PyTorch, Numpy, Self Attention, Transformers*

- Implemented a cutting-edge language model using PyTorch, enabling the generation of text from input.
- Utilized advanced NLP techniques inspired by GPT-2, including Transformers, for effective pattern capture.
- Demonstrated expertise in training and optimization within the GPT-2 framework for text generation.

**Autoencoder Visual Classification** | *PyTorch, Numpy, Seaborn, Pandas, Matplotlib*

- Trained autoencoder for precise letter recognition and transistor positioning on MNIST and MVTEC dataset.
- Engineered efficient autoencoder architecture with optimized feature extraction for image classification.
- Demonstrated 100% accurate image classification using threshold pixel-by-pixel differences.

**Wafer Map Failure Classification** | *PyTorch, Numpy, Seaborn*

- Architected a 14-layer model classifying wafer types with $> 90\%$ accuracy using the WM-811k dataset.
- Devised Augmentation layers for a noise-resistant network, slashing 80% of random chip failures.
- Analyzed and visualized accuracy and loss throughout iterations to identify over- or under-training.

## Education

**University of California Santa Barbara** **Santa Barbara, CA**
Bachelor of Science in Computer Engineering September 2020 - June 2024

**3.7 GPA, Dean's Honors, Relevant Coursework:**
Data Structures, Algorithms, Operating Systems, Applied Machine Learning and AI, Embedded Systems

## Technical Skills

**Programming Languages**: C++, Java, Python, C, SQL (Postgres), JavaScript, HTML/CSS
**Frameworks**: React, Node.js, Flask, Bootstrap, Material-UI, Storybook
**Developer Tools**: Git, Docker, Jira, Google Cloud Platform, Confluence, Perforce, NPM, Firebase, GitHub Actions
**Libraries**: pandas, NumPy, TensorFlow, PyTorch, Keras, Seaborn, matplotlib