

# Devin Setiawan

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## Education

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### University of Kansas

Master of Science, Computer Science

- GPA: 4.0
- Course Taken: Intro to AI, Intro to ML, Embedded ML, Applied Statistics, Engineering of Learning Algorithms

### University of Kansas

Bachelor of Science, Computer Science

**Graduated May, 2024**

## Research Interest

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- Interpretable Machine Learning
- Individualized Machine Learning
- Machine Learning in Medical Diagnostics Applications
- AI and Machine Learning Security

## Research Experience

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### Machine Learning Security Lab - Dr. Sumaiya Shomaji

**Aug 2024 – Present**

Graduate Researcher - Machine Learning Security and Privacy

*Lawrence, KS*

- Led an ongoing research in developing a privacy-preserving mechanism for ML systems
- Investigated different adversarial robustness and privacy trade-offs in many different machine learning models, contributing to secure and efficient ML models

### Bioinformatics & Data Science Research Center

**May 2024 – Aug 2024**

Research Intern - Bioinformatics and Applied ML in Medicine

*Lawrence, KS*

- Investigated different vision models that led to the development of a breast cancer detection model that was highlighted in “ConvNeXt Model for Breast Cancer Image Classification” paper. The paper was accepted in the 6th International Conference of Cybernetics and Intelligent System (ICORIS 2024)

### Brain, Behavior, Quantitative Department - Dr. Arian Ashourvan

**June 2023 – Present**

Graduate Researcher - Computational Neurocognition Lab

*Lawrence, KS*

- Developed interpretable scorecard model for early onset Alzheimer disease prediction with AUC comparable to complex MRI models, by using FasterRisk algorithm to find sparse linear additive model
- Led an ongoing research in inducing personalization capability to traditional machine learning model in disease classification, leading to a novel personalized framework that increased classification performance
- Cleaned and processed data from Alzheimer’s Disease Neuroimaging Initiative, an ongoing longitudinal study from 2004, using Excel and Pandas dataframe that resulted in access to clean data across multiple research team

### Analytical Chemistry Department - Dr. Rebecca Whelan

**June 2023 – Aug 2023**

Research Assistant - Whelan Research Group

*Lawrence, KS*

- Implemented fast string based classification algorithm, motif analysis, and molecular docking simulation that led to discovery of 9 new aptamer candidates used in the detection of ovarian cancer
- Led a feasibility study on in-silico DNA aptamer selection using complexity analysis of current research-grade machine learning software, leading to the initiation of a new research study in computational drug discovery
- Cleaned and processed DNA sequencing data from a sequencer using Python that resulted in a streamlined data pipeline for DNA aptamer selection, improving data accessibility to the research team

## Related Work

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### **Program Synthesis for Semantically Wrong Code Fixing (PROSE x Llama)**

Program Synthesis Project

- Inspired by the JIGSAW paper, which aims to improve LLM generated code by fixing semantically wrong code
- Used Microsoft PROSE SDK to generate AST-to-AST transformation for fixing semantically wrong code
- Implemented a working prototype of the PROSE x Llama system using Python and C#

### **Individualized Machine-learning-based Clinical Assessment Recommendation System (iCARE)**

Independent Research

- Undergraduate Research Awards 2024
- Undergraduate Research Symposium Outstanding Presentation Award

### **The Cognitive, Age, Functioning, and APOE4 (CAFE) Scorecard to Predict the Development of Alzheimer's Disease: A White-Box Approach**

Independent Research

- Research was presented in International Neuropsychological Society (INS) conference

### **TinyML Arithmetic (Arithmetic Operations Using CNN on Edge Devices)**

Embedded ML Project

- Generated datasets for digits and arithmetic operators using the MNIST dataset from TensorFlow and generated an operator dataset by capturing handwritten arithmetic operators resulting in a comprehensive dataset combining digits and operators, enabling robust model training
- Preprocessed the MNIST and operator datasets to create a unified dataset suitable for training using OpenCV (cv2) for image processing resulted in a well-prepared dataset that facilitated high model accuracy, with training results showing promising accuracy between 86-94%
- Deployed the trained model on a user-friendly platform using Streamlit to showcase its functionality and display sample test data with inference values.

### **ML Sandbox (Web Application for Automated Machine Learning Training and Deployment)**

Software Engineering II Project

- Designed an appropriate tech stack and architecture using Streamlit for the front end, FastAPI for the backend, and an SQL database for data storage, as well as implementing authentication using JWT, resulting in the successful deployment of a scalable and secure architecture that supports seamless machine learning workflows
- Built the "Autodidact" page, which allows users to upload their training files and set their ml training preferences through the website, enabling users to initiate and manage their machine learning training with minimal effort, resulting in a user-friendly interface that streamlined the machine learning training process
- Developed a feature allowing users to upload pre-trained models, rate other users' models, and download models from others, fostering a community of machine learning practitioners who could easily share and benefit from each other's work, enhancing the collaborative potential of the application.

### **Jayhawk Aero Design**

Data Science and Intelligence Team Member

- Built and managed a website for Jayhawk Aero Design that consist of analysis tools for optimization and data science team using Streamlit and Plotly, resulting in sensitivity analysis capability for AIAA rc plane competition

## Skills

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- Python: Pytorch, Tensorflow, Scikit-learn, Pandas, Matplotlib, Plotly, Seaborn
- HTML, CSS, JS, Streamlit, SvelteKit, FastAPI, SQL, AWS