Dijkstra Liu

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# Summary

Seeking **Computer Science Research opportunity**: Experienced in full-stack, web, and game development using tools like **React**, **Spring Boot**, **Flask**, and languages such as **Java**, **C++**, **Python, PHP**, **JavaScript**. Knowledgeable in **TensorFlow/PyTorch** and models like **CNN, RNN**, **Transformers**, as well as algorithms such as **SVM, decision trees, PCA, KNN**... Proficient with **Computer Vision, Computational Geometry** and **Computational Biology** algorithms and libraries.

# Education

**Washington University in St. Louis** August 2022 - May 2026

Bachelor of Science in Computer Science  **GPA 4.0/4.0**

# Technical Skills:

**Languages:** Java, C++, Python, PHP, JavaScript, C# **Frameworks and Libraries**: React, Spring Boot, Flask, Django, Node.js, Express

**Databases**: MongoDB, MySQL, Milvus  **Machine Learning Models:** CNN, RNN, Diffusion, Transformers…

**Tools and Platforms**: Git, TensorFlow, PyTorch, GPT API, Docker, AWS… **Computational Biology Algorithm:** MEME, EM…

# Working Experience:

**Washington University in St. Louis, AI for Health Institute** Oct 2024 – Now

*Researcher Assistnat*

* **Smart Kitchen:** Working as a Research Assistant at the AI for Health lab, involved in the SmartKitchen project. Contributions focus on research in action segmentation, video recognition, and data processing.

**Chinese Academy of Sciences, Institute of Chemical Process Engineering**  May 2024 – July 2024

*Computer Science Researcher Intern*

* **Algorithm Development:** Developed and implemented robotic arm object grasping algorithms using **RANSAC, k-d trees, Voronoi diagrams, and DBScan clustering** for object recognition and grasping point selection.
* **Mineral Identification Project:** Utilized laser scanning data and visual images, applied random oversampling and polynomial feature expansion, and enhanced identification accuracy by 102% using **Vision Transformer** compared to traditional mathematical models.

**Cogno**  July 2023 – June 2024

*Lead Software Developer*

* **WeChat Bot Development**: Created a bot using the **Milvus** database and **Langchain** to respond to user messages, including documents, audio, and images.
* **E-commerce Platform**: Using **React, Flask**, and **MongoDB** to design and implement an E-commerce Platform, providing AI seller and assistant during shopping. Currently providing customer service for **30+** e-commerce sellers.

**DHC Software Co., Ltd, Financial Big Data Technology Department** May 2023 - July 2023

*Computer Science Researcher Intern*

* **Backend Development & Designing**: Designed and established the backend, using Django to handle frontend requests and interactions with the LLM API. Implemented GPTCache to reduce API call costs by 30%. The API has had over **50,000 calls**.
* **Model Training**: Employed **P-tuning** to train **ChatGLM-6B**, allowing it to perform credit assessments based on bank data.

# Project Experience:

**Mixed-View Panorama Synthesis with Depth and Texture Consistency (Diffusion, Satellite, Street-View)** Aug 2024 – Now

* Led data collection and preprocessing, ensuring alignment and quality control of satellite and street-view images across diverse environments and seasons
* Implemented an efficient input/output pipeline for mixed-view synthesis, improving model data management.
* Contributed to enhancing depth and texture estimation techniques, integrating structural information from satellite views with nearby panoramas to ensure spatial and stylistic fidelity in generated panoramas.

**Human Pose Based Video Generation with Dual ControlNet-Enhanced Diffusion Models (Diffusion, ControlNet, CV, LoRa)** Mar 2024 – Jun 2024

* Mastered the theoretical frameworks underlying the dual layers of **ControlNet**, ensuring understanding of its operational methodologies.
* Executed the Diffusion training regimen directly from the source code, validating procedural integrity and cementing foundational knowledge of its internal architectures.
* Conducted an in-depth analysis of the theory behind **reference-only control and LoRA**, and successfully implemented video generation based on existing character actions.

**Bear Bazaar: Experimental WashU Internal Second-hand market (Java, Spring Boot, React, AWS)** July 2023 – Oct 2023

* Orchestrated the architecture and development of a high-performance trading platform for WashU, scaling to **serve over 3,000 students and faculty**. Leveraged **Java** and **Spring Boot** for creating resilient backend services and **React** for a responsive frontend, ensuring an engaging user interface.
* Led a cross-functional team of seven using Scrum methodologies, employing **AWS** for cloud infrastructure, ensuring robustness, scalability, and continuous **integration/continuous deployment (CI/CD)** practices with **Git** for version control.
* Implemented a continuous feedback loop with **stakeholders**, utilizing analytics and user feedback to iteratively refine platform features, focusing on **performance optimization, security enhancements**, and ensuring alignment with evolving user needs.

**Music Style Classification Using ResNet (CV, ResNet, Data analysis)** Oct 2022– Dec 2022

* Designed and implemented a system to classify music styles based on their spectrum, employing a deep residual network (ResNet) for efficient analysis.
* Processed and analyzed large datasets of music files to train the ResNet model, achieving high accuracy in distinguishing between various music genres.
* Integrated the model into a web application, using cloud services for scalable processing and storage of music files.

# Honors and Awards

* Antoinette Frances Dames Award April 2024
* 1st Place in Gold Division (out of 723 participants) of the USACO Contest Jan 2020
* Top 2% of 148,880 students, National Olympiad in Informatics in Province (NOIP) May 2019

# Organization:

**Washington University Chinese Groundbreakers (WUCG)**  July 2024 - Now

*Founder & Leader*

* **Organizational Leadership**: Led a team of 10+ executive members and managed a community of 160+ active members, fostering collaboration and mutual support among Chinese computer science students and researcher at Washington University.
* **Event Management**: Organized and executed bi-monthly activities, including WashU First Chinese Hackathon, computer science research seminars, workshops in themes like React.js, Vision transformer… enhancing the professional development of members.