Dijkstra Liu

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# Summary

Seeking **Computer Science Research and Software Engineer Intern 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. Skilled in blockchain development with **Solidity** and **FunC.**

# 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 Assistant*

* **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.

**Washington University Student Media, Inc. dba Student Life Newspaper** (<https://www.studlife.com/>) April 2024 - Now

*Senior Web Editor*

* **Web Team Leadership**: Led the web team, utilizing **Jira** and **Google Workspace** to streamline site functionality and boost team collaboration.
* **Website Resign**: Spearheaded the web team in redesigning the 2024 version of the website, leveraging **PHP, JavaScript**, and WordPress for implementation.
* **Web maintaining**: Maintained the server using **Cloudflare, A2hosting, and phpMyAdmin**, resolving over 50+ bugs within a two-month period.

**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.

**Telegram: The Open Network (TON)**  May 2024 – August 2024

*Software Development Intern*

* **Web3 Integration**: Developed and integrated a Web3 system using **Solidit**y and **Python**, focusing on user data collection, processing, and constructing user profiles to optimize marketing and user acquisition strategies.
* **LLM Fine-Tuning:** Contributed to the infrastructure setup for TON's intelligent assistant, TonGPT, by **fine-tuning large language models** (LLMs) to enhance system performance.

**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.
* **Vision based product upload**: Implemented Open AI API and search agent integration to streamline product search and upload for eCommerce platform users, enhancing user experience and contributing to platform growth.

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

*Software Development Intern*

* **Platform Creation**: Developed a user credit assessment and anti-money laundering platform using **React,** used by three banks to judge user creditworthiness and potential money laundering suspicions based on transaction records.
* **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.

**Capital Normal University, Guilin Experimental Middle School** July 2019 - July 2022

*Software Development Intern*

* **Leadership in Teaching program**: Initiated a computer support teaching project at Guilin Experimental Middle School Affiliated with Capital Normal University, where I taught over 100 students and gave over 200+ lectures.
* **Teaching in Olympiad in Informatics**: Taught information competition classes to help students learn competition algorithms and prepare for major international information technology competitions.

# Project Experience:

**Mixed-View Panorama Synthesis with Depth and Texture Consistency** 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.

**Split! Team Expense Manager** (<https://github.com/TJor-L/Split>) June 2024 – Aug 2024

* Developed a sophisticated team expense management application using **Flutter** for the frontend to deliver an intuitive user interface, and **Node.js/Express** for a high-performance backend, ensuring smooth and efficient operation.
* Applied graph theory algorithms to simplify financial transactions among team members, enhancing the user experience by reducing complexity settling expenses.
* Utilized **Docker** for deployment to maintain consistent environments across development, testing, and production stages. Adopted Git for source code management, fostering collaborative development and efficient version control.
* Implement **Open AI API** to detect bill and checks to analysis payment data.

**Human Pose Based Video Generation with Dual ControlNet-Enhanced Diffusion Models** Mar 2024 – May 2024

[(https://github.com/TJor-L/SD-based-video-generator/blob/main/Final-Report.pdf)]((https:/github.com/TJor-L/SD-based-video-generator/blob/main/Final-Report.pdf))

* 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** (<https://github.com/TJor-L/BearBazaar>) 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.

**Recoil Raiders: A multi-player 2D RPG shooting game** (<https://kennyrao.itch.io/recoil-raiders>) Jun 2023– Sep 2023

* Spearheaded the development of "Recoil Raiders," a multi-player 2D RPG shooting game using **Unity** and **C#**.
* Took the helm in game design, conceptualizing and detailing the game's narrative, characters, and setting to create a compelling backdrop for the gameplay.
* Implemented **local area network (LAN)** multiplayer capabilities, permitting players to team up or combat in real-time.
* Designed and integrated character skill effects, enriching gameplay dynamics.

**Team Event Management System Similar to Google Calendar** Jan 2023– March 2023

* Developed key functionalities using **PHP, JavaScript, HTML, and AJAX**, such as event addition and team joining to view collective events.
* Executed core event management logic, encompassing the addition, deletion, and modification of events.
* Crafted a **MySQL** database structure to securely store user data and event details.

**Music Style Classification Using ResNet**  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.

# Organization:

**Washington University Chinese Groundbreakers (WUCG.com)**  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.

# Honors and Awards

* Antoinette Frances Dames Award April 2024
* Distinction Rank (Top5%) in 2021 AMC 12A Jan 2020
* 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