Jungeun Hwang

West Lafayette, IN hwang227@purdue.edu https://jungh.vercel.app/ https://www.linkedin.com/in/jung31

Education

Purdue University, West Lafayette, IN, U.S. Aug 2021 – May 2025 (expected)
B.S. in Data Science & Applied Statistics

Research Experience

Digital Agriculture Discovery Lab West Lafayette, IN
Advised by Dr. Dharmendra Saraswat at Purdue University May 2023 – Present

- Engineered a customized NLP chatbot for a control system that provides farmers with precise and effective treatment instructions
- Fine-tuned a deep learning model (BERT) to categorize text inputs, enabling automated and effective query routing
- Implemented and managed a vectorized database with Pinecone to retrieve the top 3 most relevant pieces of information based on the given inputs
- Developed a pipeline to extract and embed data from a 500+ page PDF for semantic search, achieving an information retrieval accuracy of 75%
- Conducting benchmark evaluations to assess the response generation capabilities of the NLP system against current industry standards

LRNING Lab Seoul, South Korea
Advised by Dr. Sungyoon Lee at Hanyang University May 2024 – Aug 2024

- Experimented with transformer models, examining their attention mechanisms with a focus on linear efficiency
- Optimized transformer model architectures and hyperparameters for machine translation, achieving a substantial reduction in training loss from 7.29 to 0.24
- Analyzed and documented emerging trends in large language models, in-context learning, transformer optimization, and trustworthy AI
- Participated and presented in weekly lab study with the book *Probabilistic Machine Learning: An Introduction/Advanced Topics*

Graduate Course Semester Research Aug 2024 – Present
CS59300CVD: Computer Vision with Deep Learning, instructed by Dr. Raymond Yeh

- Reimplemented the Recurrent Vision Transformer (RViT) architecture based on the paper *Recurrent Vision Transformer for Solving Visual Reasoning Problems*, modifying it to suit action recognition tasks.
- Adapted the RViT model for a cross-modality task by tailoring the architecture for image training and video prediction, demonstrating its versatility in action label inference.
- Enhanced the model with custom architectural adjustments, including refined attention mechanisms and recurrent dropout, to optimize performance for video-based action recognition.

The Data Mine – Purdue University West Lafayette, IN
Undergraduate Data Science Researcher Aug 2021 – May 2022

- Collaborated with John Deere to analyze machine diagnostic trouble codes (DTCs) and their impact on equipment uptime
- Created visualizations to assess the influence of DTCs, facilitating insights on machine reliability
- Developed solutions to reduce equipment fault detection time by 17% enabling prompt repairs to avert critical and costly failures

Publication

Hwang, J., Aggarwal, V., Ha, T. S., Ahmad, A., & Saraswat, D. (n.d.). Ag-DOST: A friendly and intelligent chatbot for farmers [Manuscript in preparation].

Professional Experience

DIAL Ventures — West Lafayette, IN
Data Analyst Intern, advised by Dr. Lourival Monaco — Aug 2023 – Present

- Applied data preprocessing, analysis, and visualization techniques to deliver impactful solutions for 300+ business executives and decision-makers
- Automated and streamlined the categorization, storage, and retrieval of 6 base industry sentiment surveys using Qualtrics and MySQL, reducing processing time by 30%
- Constructed an ETL pipeline using Python libraries and Apache Spark to process large-scale data, enabling near real-time visualizations in Tableau
- Leveraging web scraping and data mining to gather and process crop budget data, presenting regional and state-level variations through visualizations
- Participating in bi-semester sprint week events where all DIAL innovation fellows present startup solutions addressing current market needs

Leadership and Involvement

Purdue Korean Association (PKA) — West Lafayette, IN
Full Stack Web Developer — Jan 2024 – Aug 2024

- Developed a scalable web application that allows students to access career opportunities, find information about Purdue, and connect via a social networking platform
- Implemented unique view counts for each post to track engagement effectively
- Built a hybrid Single Page Application (SPA) utilizing Next.js for server-side rendering and static page generation, with Nest.js as the backend framework
- Leveraged TypeScript for type-safe development and MySQL for data persistence to ensure robust data handling
- Engineered relational models using TypeORM and created structured RESTful APIs with well-defined HTTP endpoints

Information Technology at Purdue — West Lafayette, IN
Technology Coordinator — Mar 2022 – Jan 2023

- Supervised computer labs, monitored stations, and restored devices using station status tracking software
- Provided technological support to students and faculty, addressing printing, login authentication issues, and troubleshooting network issues
- Maintained consistent communication with 100+ head offices and coworkers

Teaching and Mentorship

The Data Mine – Purdue University — West Lafayette, IN
Teaching Assistant — Aug 2022 – May 2023

- Led a team of 10 undergraduate researchers in collaboration with the Radiogenic Isotope Geology Lab, implementing agile methodologies to foster a collaborative and iterative research environment
- Provided individualized feedback on student reports, adapting leadership approaches based on each student's reflections and learning challenges
- Paired students based on complementary strengths and created foundational Python tutorials on data wrangling and visualization to bridge gaps in computational skills and backgrounds

Dcoinstitute — Seongnam-si, South Korea
Coding Tutor — May 2022 – Aug 2022

- Instructed 20+ middle school students in Scratch, S4A, and Arduino, fostering foundational programming skills
- Developed and delivered dynamic Python classes, tailored to varying skill levels
- Created and organized engaging lesson plans and materials for effective learning

Awards and Honors

SURF Best Poster Award — West Lafayette, IN
Aug 2023

- 2023 Best Poster Presenter award from Purdue's Engineering Undergraduate Research Office among 250+ undergraduates

Dean's List — West Lafayette, IN

- Fall 2021, Spring 2022, Spring 2024

Semester Honors West Lafayette, IN

- Fall 2021, Fall 2023, Spring 2024

Woowa scholarship Aug 2023 – May 2024

- Merit-based scholarship funded by Woowa Brothers' founders, Kim Bong-jin and Sul Bomi, as one of 10 recipients

Presentations

Summer Undergraduate Research Symposium West Lafayette, IN
Aug 2023

- Delivered a poster presentation on *Intent Classification-based Interactive Chatbot for Weed Management*

The Data Mine Corporate Partners Symposium West Lafayette, IN
May 2023

- Delivered a poster presentation on *Isotopic Analysis with IsotopX x62 TIMS: Time-Series Trends in Pb & U Measurements*

Relevant Skills

Programming: Python (Pandas, TensorFlow, PyTorch, scikit-learn, Flask), R, Java, React Native, MySQL, Next.js, C, JavaScript, TypeScript, Apache Spark

Software: LaTeX, HTML, Microsoft Office, Linux, Tableau, Android Studio

Language: English, Korean