Krirk Nirunwiroj

210 N Charter St, Apt 204, Madison, WI, 53715 • (+1) 608 292 0684 • nirunwiroj@wisc.edu
krirk-n.github.io • github.com/krirk-n • linkedin.com/in/krirk-nirunwiroj

Education

University of Wisconsin-Madison — Madison, WI
B.S. in Computer Science, Data Science, and Certificate in Mathematics — Sep 2020 - May 2024
GPA: 3.78/4.00

Relevant Coursework:

- **Computer Science/Data Science**: Programming 2 & 3 (Java), Computer Engineering, Machine Organization and Programming, Data Modeling 1 & 2 (R), Data Science Programming 2 (Python), Database Management Systems, Artificial Intelligence, Classification and Regression Trees, Algorithms, Big Data Systems, Mobile Systems and Applications, Building User Interfaces
- **Mathematics**: Discrete Mathematics, Calculus 2 & 3, Matrix and Linear Algebra, Linear Optimization, Theory of Probability, Graphs and Networks in Data Science

Honors

Dean's List, College of Letter and Science at UW-Madison — 2020 - 2023

Full Scholarship, The Ministry of Higher Education, Science, Research and Innovation of Thailand (Royal Thai Government's Scholarship) — 2019 - Present

Research Experience

Epistemic Analytics Lab, Wisconsin Center for Education Research, UW-Madison — Madison, WI
Position: Research Intern | Director: Professor David Williamson Shaffer — Mar 2023 - Present

- Optimized data analytics process and pipeline for the iPlan project, dramatically reducing execution time from minutes to mere seconds. (Repository: https://github.com/krirk-n/iplan-pipeline)
- Utilized Epistemic Network Analysis (ENA) and Ordered Network Analysis (ONA) with R and Python to analyze data, contributing vital insights to the lab's ongoing study.
- Collaborated with Assistant Professor Ji Hyun Yu from the University of North Texas, setting up databases and automating data cleaning and transformation processes using Python and SQL.
- Engaged in thorough QA testing, identifying challenges, and proposing effective solutions for the Codey project—an automated coding application for quantitative ethnography research.
- Provided technical support and problem-solving assistance during the Codey workshop and ONA workshop at the Summer Institute held by the lab, catering to over 20 participants consisting of quantitative ethnography researchers from around the world.
- Enhanced newcomer guidelines and provided mentorship to a fellow research intern, imparting fundamental data analysis techniques and adept utilization of the lab's technologies and tools.

TRASHBOT, Undergraduate Machine Learning Research Community, UW-Madison — Madison, WI
Position: Student Researcher | Project lead: Ryan Jacobs (Research Scientist II) — Oct - Dec 2022

- An automated trash collection drone project; participating in the Computer Vision team.
- Transformed JSON files from the TACO dataset into structured YOLO format dataset using Python and Google Colab.

- Automated training pipeline with YOLOv5 and YOLOv7 models, optimizing performance through fine-tuning.
- Visualized model results using ClearML, providing insights into model predictions.
- Delivered weekly progress reports to the project lead, showcasing advancements.
- Developed a robust model capable of identifying trash in 80 categories within input images.

LAIGA, a machine learning-based framework for assessing and identifying leaders in college students Mahidol University, Thailand Jun - Aug 2021

Position: Researcher | Advisor: Associate Professor Suppawong Tuarob

- Conducted literature review, laying the foundation for the project's research direction.
- Employed Excel tools and VBA coding to cleanse and organize survey data for analysis.
- Utilized Java and SQL to extract and refine data from the HeidiSQL server housing the university registrar's database.
- Utilized Java with Weka API to automate and channel data into a machine learning model training.
- Handled a spectrum of machine learning models, including Random Forest, Support Vector Machine, Naive Bayes, Sequential Minimal Optimization, and Multilayer Perceptron.
- Fine-tuned model parameters to optimize performance, ensuring the resulting model's accuracy.
- Validated the proposed approach, yielding impressive results of 5.87% MAPE in leadership assessment and an impressive 83.2% F1 score in leadership identification.

Publications

Published in a peer-reviewed journal

Pongpaichet, S., **Nirunwiroj, K.**, & Tuarob, S. (2022). Automatic assessment and identification of leadership in college students. *IEEE Access*, *10*, 79041–79060. https://doi.org/10.1109/access.2022.3193935

Presentation

Nirunwiroj, K., "Chitchat Bots: A Comparative Study and Behavioral Analysis of Large Language Models Using Epistemic Network Analysis," International Conference on Quantitative Ethnography 2023, October 8-12, 2023, Melbourne, Australia

Work Experience

Agoda Services Co., LTD. Bangkok, Thailand

Position: Software Engineer Intern, Back End Team (YCS Desktop team) May - Aug 2022

- **1st Runner-up**, Agoda Intern Pitch Competition 2022, designed and pitched the travel planner feature to lead employees and executive board members.
- Practiced Scrum methodologies with a 16-engineers team, collaborating flexibly with other teams.
- Improved website efficiency by eliminating RUM and BoomerangJS via Grafana-tracked measures.
- Enhanced security by transitioning C# codebase from REST API to Gateway API
- Used Scala and SQL to modify database queries, tests, and codes from calling main database to copied database.

- Updated payment method descriptions using React, anticipating a 5% UPC payment option increase.
- Initiated YCS white-label configurations for integration across 10,000+ sites via Priceline Partner Network and Agoda Affiliates.

Teaching Experience

MATH 112 - College Algebra (Precalculus) Madison, WI
Position: Student Assistant 2021 - 2022

- Facilitated breakout discussion groups of 4-5 students each, within a class of over 50 students.
- Hosted drop-in sessions in the Pre-Calculus Lab, providing support to fellow students.
- Collaborated with professors to address challenges, offering solutions and teaching approaches.

C++ Programming Workshop Phuket Wittayalai School, Thailand
Position: Instructor 2017

- Conducted a comprehensive lecture on C++ programming, catering to 30 middle school students enrolled in the gifted program.
- Crafted engaging homework assignments and interactive in-class tasks, fostering hands-on learning and practical skill development.
- Provided after-class consulting, offering guidance on programming concepts and higher education pathways, enhancing students' holistic learning experience.

Selected Projects

SixCents Madison, WI
Position: Full Stack Developer; Team of 4 Oct 2021 - Mar 2022

- Secured **1st place** at CheeseHacks 2021 hosted by UW-Madison with a ReactJS version.
  (Repository: https://github.com/thananunmick/sixcents | Presentation: https://youtu.be/VyKIMg4Vhqo&t=940s)
- Submitted to the Google Developer Student Club Solution Challenge 2022 with a Flutter version.
  (Repository: https://github.com/thananunmick/sixcentsgoogle | Presentation: https://youtu.be/A8bjnTmZ8Sw)
- Developed a comprehensive mobile/web application tailored for individuals with deaf-blindness, featuring Text-to-Braille, Image-to-Braille, and handwriting recognition functionalities.
- Assumed a leadership role, providing direction for the application's name, graphics, demonstration, and presentation.
- Employed Dart to craft the application's user interface, integrating vibration features to enhance accessibility on each page.
- Implemented image recognition capabilities for the image-to-Braille feature using Heroku and Flask technologies.
- Tested and constantly maintained the project to keep improving the user experience

Lil Amazon Remote
Position: Backend Developer; Team of 4 Mar 2021

- A Java application emulating an online shopping platform, utilizing a Red-Black tree data structure for efficient data storage.
- Designed and executed backend using Java, establishing a foundation for frontend development.
- Implemented Red-Black Tree algorithms, adapting them to align with specific Java classes.

Flight Planner Remote
Position: Data Wrangler; Team of 4 Apr 2021

- A Java application employing Dijkstra's algorithm to determine optimal flight plans.
- Programmed Java code to extract data from a web-based flight routine database.
- Formulated class attributes and function methods, ensuring effective representation of flight and airport entities.
- Implemented Dijsktra's algorithm, adapting it to align with specific Java classes.

Virtual Lab: AP Physics Mechanics North Andover, MA
Position: Full Stack Developer May 2020

- Developed a Python-based (mBlock) application simulating interactive physics laboratory activities based on AP® Physics 1 and 2 Inquiry-Based Lab Investigations by CollegeBoard.
- Implemented realistic gravity simulation and auto-plotting features for objects' positions, speed, and acceleration, enhancing the authenticity and educational value of the lab activities.
- Facilitated the utilization of this application by a high school AP Physics teacher during the pandemic, providing essential support for virtual classroom activities.

Leadership and Involvement

Thai Student Association at UW-Madison Madison, WI
Position: **Vice President** 2021 - 2022

- Played a pivotal role in organizing the Laos-Thai-Cambodian New Year event in collaboration with APIDA, achieving participation from over 60 attendees.
- Curated bi-weekly meeting agendas, optimizing time allocation for productive discussions.
- Provided adept oversight to 3 distinct event planning committees, ensuring cohesive collaboration and successful execution.
- Facilitated a seamless transition for the upcoming executive board by reorganizing and coordinating the election of essential positions.
- Revamped the organization's online presence, encompassing the enhancement and continuous maintenance of the official website, social media platforms, and online merchandise store.
- Assumed financial responsibility by monitoring expenditures and ensuring the financial accuracy of records, working in tandem with the financial chair.

Technical Skills

Languages: Python, SQL, R, C, C++, C#, Java, JavaScript, HTML, CSS, Dart, VBA
Frameworks & Platforms: Docker, Hadoop, Grafana, Weka, Scikit-learn, Tensorflow, Pandas, PyTorch, HeidiSQL, ArangoDB, Flask, React, Flutter, Google Cloud Platform, GitHub, GitLab

References

Professor David Williamson Shaffer
Sears Bascom Professor of Learning Analytics and Vilas Distinguished Achievement Chair of Learning Science, University of Wisconsin-Madison
499 Educational Sciences, 1025 West Johnson Street, Madison, WI 53706-1706
608-890-3443
dws@education.wisc.edu

Associate Professor Suppawong Tuarob
Computer Science Academic Group, Faculty of Information And Communication Technology, Mahidol University
999 Phuttamonthon 4 Road, Salaya, Nakhon Pathom, Thailand 73170
suppawong.tua@mahidol.edu

Pakorn Weecharungsan
Development Manager at Agoda Services Co., LTD.
999/9 Rama I Road, 27th Floor, Central World Office, Pathumwan, Bangkok, Thailand 10330
pakorn.weecharungsan@agoda.com