Krirk Nirunwiroj

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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, Computer Engineering, Machine Organization and Programming, Data Modeling 1 & 2, Data Science Programming 2, 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

- Applied Epistemic Network Analysis (ENA) and Ordered Network Analysis (ONA) in R and Python for data analysis, contributing key insights to lab studies.
- Renovated the iPlan game's data analysis pipeline, cutting execution time from minutes to seconds. (Repository: https://github.com/krirk-n/iplan-pipeline | game website: https://www.i-plan.us/)
- Used ONA to develop models for understanding and categorizing users' play styles of iPlan.
- Collaborated with Dr. Ji Hyun Yu, University of North Texas, to establish databases and automate data preprocessing using Python and SQL.
- Engaged in QA testing, identifying challenges, and proposing effective solutions for the Codey application.
- Facilitated technical support and problem-solving in Codey and ONA workshops at the QE Summer Institute 2023, assisting over 20 international quantitative ethnography researchers.
- Built and designed template Rmarkdown files for ENA and ONA workshops for the International Conference on Quantitative Ethnography 2023.
- Improved guidelines for new interns, mentoring in data analysis techniques and lab technologies.

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

- An automated trash collection drone project; participating in the Computer Vision team.
- Converted TACO dataset JSON files to structured YOLO format using Python and Google Colab.
- Automated training with YOLOv5 and YOLOv7 models, fine-tuning for enhanced performance.
- Delivered weekly progress reports to the project leader, 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 a literature review to guide the project's research direction.
- Utilized Excel and VBA to clean and organize survey data for analysis.
- Extracted and preprocessed data from the HeidiSQL server using Java and SQL.
- Automated data processing for model training and correlation-based feature subset selection algorithms using Java with Weka API.
- Performed model selection from 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.
- Achieved a 5.87% MAPE in leadership assessment and an 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

Published in a peer-reviewed conference proceedings journal

Nirunwiroj, K. (2023). Chitchat Bots: A Comparative Study and Behavioral Analysis of Large Language Models Using Epistemic Network Analysis. *Fifth International Conference on Quantitative Ethnography: Conference Proceedings Supplement,* 154-157

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 presented a new travel planner feature to senior employees and executive board.
- Practiced Scrum methodologies with a 16-engineer team, collaborating flexibly with other teams.
- Boosted website efficiency by removing RUM and BoomerangJS, using Grafana for performance tracking.
- Enhanced security by transitioning the C# codebase from REST API to Gateway API.
- Modified database queries, tests, and codes in Scala and SQL, shifting from the main database to a copied database.
- Updated payment method descriptions using React, anticipating a 5% UPC payment option increase.
- Initiated YCS white-label configurations, enabling integration across over 10,000 sites in 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

- Delivered an intensive C++ programming lecture to 30 gifted-program middle school students.
- Designed engaging homework and interactive classroom activities to promote hands-on learning and skill development.
- Offered after-class consultation, assisting with programming concepts and advising on educational pathways, enriching the students' overall learning experience.

Selected Projects

Oyasumi Madison, WI
Position: Android Developer; Team of 4 Sep 2023 - Dec 2023

- Developed an AI-powered sleeping diary app with features: dream notes, interpretation, alarm clock, and sleep summary. (Repository: https://github.com/krirk-n/Oyasumi)
- Assumed a leadership role, proposed the application's features, and managed task distribution.
- Used Figma to design user interfaces and create a prototype for the app proposal.
- Implemented the app in Android Studio using Java, including:
  - Used SQLite to implement the database for notes and relevant data.
  - Used GPT3.5 to implement the dream interpretation feature.
  - Used the MPAndroidChart library to visualize sleep data consisting of sleep duration and quality.
- Created a presentation poster and demonstration video and presented the app to over 100 audiences.

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 mobile/web app for individuals with deaf-blindness, featuring Text-to-Braille, Image-to-Braille, and handwriting recognition.
- Assumed a leadership role, providing direction for naming, graphics, demo, and presentation.
- Utilized Dart for UI development, integrating vibration features for enhanced accessibility.
- Implemented image recognition for the image-to-Braille feature using Heroku and Flask.
- Conducted ongoing testing and maintenance to enhance user experience.

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.
- Featured realistic gravity simulation and auto-plotting for object positions, speeds, and acceleration, enhancing the lab's realism and educational value.
- Supported a high school AP Physics teacher in using this application for virtual teaching during the pandemic, aiding in remote classroom activities.

Leadership and Involvement

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

- Key organizer of the Laos-Thai-Cambodian New Year event, drawing over 60 attendees in collaboration with APIDA, Multicultural Student Center, and Thai instructors at UW-Madison.
- Curated bi-weekly meeting agendas, optimizing time allocation for productive discussions.
- Oversaw 3 event planning committees, ensuring effective collaboration and event success.
- Streamlined executive board transition by reorganizing board positions and holding elections.
- Enhanced and maintained the organization's online presence, including the website, social media, and online store.
- Handled financial oversight, maintaining expenditure records in collaboration with the financial chair.

Technical Skills

Languages: Python, R, SQL, AQL, C, C++, C#, Java, JavaScript, HTML, CSS, Dart, VBA, LaTeX
Frameworks & Platforms:

- Machine Learning Frameworks: PyTorch, Weka, Scikit-learn, TensorFlow, NumPy, Pandas, Hugging Face
- Web/App Development Frameworks: React, React Native, Figma, Flutter, Flask, Postman, Android Studio
- Data and Cloud: Docker, Hadoop, Spark, Cassandra, Kafka, Grafana, ArangoDB, Google Cloud Platform

References

Professor David Williamson Shaffer
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