Jirayu Burapacheep

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Education

University of Wisconsin-Madison — Major GPA: 4.00 / GPA: 3.93

- B.S. in Computer Science and Data Science — 2019 - Present (2023)
- **Relevant Courseworks**: Algorithms, Operating Systems, Database Systems, Optimization, Multivariable Calculus, Information Security, Quantum Algorithms (Graduate level)
- **Online Coursework**: Deep Learning Specialization by deeplearning.ai (Coursera)
- Received a scholarship from Royal Thai government

Research Experiences

Undergraduate Research Assistant — Sep 2022 - Present

Research Group led by Professor Sharon Li, Department of Computer Science, UW-Madison

- Study different approaches on out-of-distribution (OOD) detection including density-based, distance-based, and output-based methods
- Perform experiments to understand the nature of the existing state-of-the-art OOD detection method using contrastive learning
- Work on experimenting and loss designing to see the extending potential of using contrastive learning on OOD detection

Undergraduate Research Assistant — Sep 2021 - Present

Under a collaboration between Department of Life Sciences Communication (Professor Kaiping Chen) and Department of Computer Science (Professor Sharon Li), UW-Madison

- Contributed to the conversational data collection part of the research by building a web application that collects interaction between survey participants and OpenAI's GPT-3 chatbot model
- Studied suitable prompt design for language model to be used as a reasonably chatbot
- Paper planned to submit to PNAS journal

Research Project Participant — Feb 2021 - Jun 2021

Cloud Based Prediction Tools for Materials Properties, Information Skunkworks Group (Professor Dane Morgan), Department of Material Science & Engineering, UW-Madison

- Explored statistical methods relevant to material properties prediction research
- Gathered performance comparison between different models on predicting molecule homo-lumo gap

Publication

Chen, K., Shao, A., **Burapacheep, J.**, & Li, Y. A critical appraisal of equity in conversational AI: Evidence from auditing GPT-3's dialogues with different publics on climate change and Black Lives Matter. — Sep 2022

- Auditing study to examine how GPT-3 responded to different sub-populations on crucial science and social topics: climate change and the Black Lives Matter (BLM) movement
- Link: https://arxiv.org/abs/2209.13627

Work Experiences

Google, Software Engineer Intern — May 2022 - Aug 2022

- Explored and implemented a method to improve Google Recipes Search results ranking by utilizing rating score, thumbnail image quality, and other signals
- Improved recipes grouping with majority users' historical query refinements and achieve positive metrics feedback from human evaluation

Data Wow Co., Ltd., Machine Learning Engineer Intern Jun 2021 - Aug 2021

- Reduced 83% of a human workload in ID card spam checking by switching to an AI solution to recognize similar cards and designing a backend system to self-maintain a card database
- Utilized few-shot object detection algorithm for image self-labeling application

Honors and Awards

ICPC 2020 World Finals - International Collegiate Programming Contest, High Honor Award Oct 2021

- Ranked 17th in ICPC 2020 World Finals (4th place among all North American teams)
- Ranked 1st in ICPC North Central North American Regional Contest 2020

IOI 2018 - International Olympiad in Informatics, Bronze Medalist Sep 2018

- International informatics competition for high school students worldwide

APIO 2018 - Asia-Pacific Informatics Olympiad, Silver Medalist May 2018

- International informatics competition for high school students within the South Asian / Western Pacific region

eBay 2021 University Machine Learning Competition, 4th Place Jan 2022

- Trained and hyperparameter tuned LightGBM model to accurately predict the estimated delivery date on 15 million rows of eBay shipments data

Google Code Jam Competition 2020, Top 1% 2020

- Implemented C++ to solve algorithmic problems designed to minimize time complexity
- Ranked 621st place on the competition (Top 1% of all the contestants)

Teaching Experiences

Guest Lecturer, UW-Madison ICPC Club

- Lead and facilitate discussion on centroid decomposition, an advanced graph algorithm in competitive programing, and its usage in ICPC problems Apr 2022
- Held a training session on the topic of string matching and advanced data structures problems in ICPC contests with the UW-Madison ICPC participants. Oct 2022

Private Tutor Jun 2021 - Aug 2021

- Held a weekly meeting with high school students who were interested in joining Thailand Olympiad in Informatics on fundamental topics in mathematics, algorithms, and data structures

Selected Personal Projects

Wisc-course-alert Apr 2021 - Apr 2022

- Request course status from UW-Madison enrollment website via Rest API
- Manage users watching list databases and notify them when the courses become available (using NodeJS and MongoDB)
- Link: wiscoursealert.com

Parrot.Ai Mar 2022 - Apr 2022

- Developed a platform that allows users with low literacy to fill out forms without having to read or write to improve essential services accessibility using ReactJS and TailwindCSS
- The platform scrapes Google Form and utilizes Google Speech-to-Text and Text-to-Speech API for input and output conversion
- Link: parrot-ai.vercel.app

Zero-shot Voice Conversion Jun 2021 - Jul 2021

- Implemented and trained an extended StarGAN-family deep learning model that modifies the speech of a source speaker and makes their speech sound like another target speaker without changing the linguistic information
- Link: github.com/Top34051/stargan-zsvc

Music Style Transfer Mar 2021 - Jun 2021

- Scraped audio data from YouTube and performed vocal and music source separation using Demux
- Train generative adversarial network family model that modifies the given song to adopt the genre of another song.
- Link: github.com/Top34051/auto-cover

Self-maintenance Convenient Store Shelf Mar 2021

- Trained R-CNN object detection model for counting the number of products left on the shelf for each brand and adapted it to work on a densely packed scenario

IBM Call for Code Spot Challenge for Wildfires Nov 2020 - Feb 2021

- Applied multiple time-series forecasting (AR, MA, ARIMA, FB Prophet, etc.), machine learning models (XGBoost, RandomForest, etc.), and simple LSTM model to estimate wildfires in Australia
- Ranked 1st on January prediction

Leadership and Involvement

Event Planning Committee, Thai Student Association (TSA) at the UW-Madison Oct 2019 - Aug 2020

- Organized social events each semester to create a bond between members and provide support
- Represented and shared Thai culture to UW-Madison community through holding several public cultural events
- Helped planning the fundraising event selling traditional food and raise over $600 among three international organizations

Task Setter and Staff, Thailand IOI Representative Selection Camp 2018 - Present

- Design advanced algorithm and data structure problems that aim to have a difficulty level comparable to the IOI problems for Thai IOI Representative Selection camps

Contest Setter, Codeforces Feb 2019

- Initiated and organized a whole competitive programming contest for both division 1 and 2 contestants on Codeforces platform with total of 8,000 participants
- Link: https://codeforces.com/contest/1130 and https://codeforces.com/contest/1129

Technical Skills

- Languages: C++, Python, R, Java, Javascript
- Frameworks & Platforms:
  - Deep Learning: PyTorch, Detectron2, Tensorflow, Keras, Pandas, Hugging Face
  - Web/App Dev: Docker, ReactJS, NodeJS, Flask, Celery, AWS, Google Cloud Platform, PostgreSQL, MongoDB, Elasticsearch