

Research interest

The issue of Artificial Intelligence (AI) has always become my interest since emergence of various tools such as ChatGPT and Bard. Recognizing that my passion lies in AI, I am eager to delve deeper into this field through pursuing a Master's degree in National Yang Ming Chiao Tung University (NYCU).

One of the critical issues happening in Indonesia is about cyber attacks. In 2022, Indonesia faced nearly 1 billion cyber attacks, as reported by CNN Indonesia. The type of attacks comprised of malware and data leaks. Consequently, 337 million Indonesia citizen's personal data leaked where can lead severe consequences such as bank and social account breaches.

To overcome this issue, in my opinion, an AI based system is needed because the enormous volume of attempts to breach the application. This AI system will be able to identify suspicious actions from user assumed as a fake user. After detecting such actions, the system will issue notifications and proper measures will be taken to prevent further incidents. Given this condition, based on my education background, I am currently only capable of creating simple AI models. I still need to learn how to build the best and most effective models to detect the cyber threat. Realizing this knowledge gap, I would like to deepen my knowledge in Machine Learning by applying to a Master's degree program in Artificial Intelligence.

Self background

My experience is working as Software Engineer where one of the program that I developed was a financial application for my campus as part of my thesis project. My responsibility was to reconstruct an existing application that had been in use for around 15 years and also added new functionalities to support various stakeholders. The main function of the website was to generate Chart of Accounts (COA) and program frameworks to organize activities in each unit at ITS. Activities for the next school year were prepared, along with cost breakdowns for each goods and service to be purchased. I also implemented validation checks to ensure alignment between budgets and work plans, encompassing multi-level approvals from various ITS stakeholders responsible for the activities. I built the application using a specific paradigm and architecture proposed by my supervisor to ensure ease of maintenance. Throughout the execution, I collaborated with many stakeholders and individuals responsible for the application, such as System Analysts and Full-stack Developers. The project was completed in six months and passed all use case tests. The application users I interviewed expressed satisfaction with the developed application. The project received a perfect grade of A and is published on the campus internal site, accessible at this URL: <https://repository.its.ac.id/100713/>.

I had another opportunity to hone my skills when I worked as a freelance software engineer in September 2023. During this period, I collaborated with a client who was a surgeon at Dr. Soetomo Government Hospital in Surabaya and pursuing specialization at Airlangga University. My responsibility was to develop a website that could satisfy specific business processes crucial for client. The main requirement was to create a website capable of managing infusion fluid for post-surgery patients. The website also provided functionality for automatically recommending infusion fluid based on some criteria including calories,

potassium, sodium, and more. This application proved to be a useful asset for the surgeon, enabling faster and more accurate calculations compared to the manual calculation previously employed, which can easily lead to human error. The project finished within 2 months and can be seen in this following URL <https://pandu-nutrisi.com/>.

Based on the projects I have worked on, which involved the financial plan of the campus and the personal data of patients, both of them are related to confidential information that must not be leaked. Therefore, security is an important aspect to be considered. This has encouraged me to pursue further studies on how to implement AI in cybersecurity.

Motivation for applying

My main reason to pursue a Master's degree in Artificial Intelligence at NYCU is its outstanding reputation and consistent placement among the top 5 Computer Science universities in Taiwan according to the QS World University rankings. The university's AI department actively conducts research in areas that align with my interests, especially in applying AI to cybersecurity. The university also has a significant number of professors who are experts in the AI field. Through this research group, I am particularly interested in working under Prof. Ying-Dar Lin with his specialization of AI and cybersecurity where I can learn and contribute through conferences and journal publications.

I choose to study in Taiwan because of its remarkable advancement in semiconductor technology which is known as Taiwan Semiconductor Manufacturing Company (TSMC). Taiwan's semiconductor is widely used in various electronic devices including by major companies such as Apple, AMD (Advanced Micro Devices), and NVIDIA. The advanced technology in semiconductors especially in GPU is highly related to AI. The high performance GPU have important role in significantly reducing the training time of machine learning models. Therefore, by selecting Taiwan for my Master's Degree, I will gain support from the latest technology and I believe it is the best destination to deepen my interest in the field of AI.

Future plan

Furthermore, Chinese is one of the most widely spoken languages globally. Therefore, I plan to enroll in Chinese course from March to August at NTNU (National Taiwan Normal University) Taiwan to enhance my communication skills, both in the college and daily life in Taiwan. Throughout my studies, I aim to expand my experience by pursuing an internship as a Machine Learning Developer and actively participating in organizations such as PPI Taiwan, to build deeper relationships with Indonesian students in Taiwan.

To validate my understanding, I am planning to pursue certifications in both cybersecurity and Artificial Intelligence. For the cybersecurity field, I aim to achieve certifications such as CompTIA and Certified Ethical Hacker (CEH). On the other hand, for the AI field, I am eager to earn the TensorFlow Developer Certificate, showcasing my proficiency in developing machine learning models using one of most widely used AI frameworks. AI encompasses very wide aspect, and Generative AI is one of them. It's capability to create syntetic text, sound and images has evolved rapidly. Applications like ChatGPT is an real result of the development using this technology, which is why I am interested to dive deeper into it.

After completing my master's study, my interest lies in working in the field of AI, where I can face real-world problems and apply the theoretical knowledge gained during my studies. My future goal is to become an expert in Artificial Intelligence. To further specialize deeply, I plan to pursue a Ph.D. focused on Artificial Intelligence. Through the Ph.D., my aim is to deepen my knowledge and research capabilities through collaboration with experienced professors and researchers. Upon completing my Ph.D., I am interested to work at the renowned semiconductor companies in Taiwan like Intel or Nvidia, because their significant integration of AI in GPU technology for enhancing the computing capabilities. Based on my educational background and qualification, I am confident that I am a qualified candidate for NYCU and will not disappoint NYCU through my commitment and hard work. I truly believe that if I selected for a scholarship, I will contribute more and make greater contributions to NYCU.