

Project title: Artificial Intelligence for Software Engineering

Project descriptions: As software products become pervasive in all areas of our society, building high-quality software in a productive manner becomes crucial to the software industry. The rise of Artificial Intelligence (AI) is potentially a game changer in improving software quality, accelerating productivity and increasing project success rates. This project theme is to explore and develop AI-powered capabilities (e.g. algorithms, models and prototype tools) which can assist software teams in some specific areas of software development (e.g. requirements, design, implementation, testing and maintenance and evolution). This AI support can be in various forms, from automating routine tasks to providing project analytics and actionable recommendations, and even making decisions for software development teams. If you are interested in this project theme, please feel free to contact me, and we can discuss to formulate a specific project in this theme that you are keen to work on.

Project title: Artificial Intelligence for Cybersecurity engineering

Project description: Cyberattacks are one of the greatest existential threats to national security, economy and society. Cyberattacks are often formed by exploiting vulnerabilities in software applications. Existing techniques and tools for security analysis are no longer able to cope with the significant increase in the size and complexity of applications, resulting in a massive number of attack-prone vulnerabilities reported in recent years. This project theme is to explore and develop a novel set of AI-powered automated solutions which tackling security vulnerabilities throughout the software lifecycle. We will develop AI machine learners that are capable of recognizing vulnerability threats (e.g. detect malwares in apps or detect vulnerabilities in code) and suggesting fixes for the detected vulnerabilities. If you are interested in this project theme, please feel free to contact me, and we can discuss to formulate a specific project in this theme that you are keen to work on.

Project title: Engineering AI-powered systems (AI Engineering)

Project description: Artificial Intelligence (AI) has started making a substantial impact to many parts of our society. However, engineering reliable AI systems that are deployed in industrial settings is still challenging for many organisations. AI Engineering covers a broad range of many activities such as: creating/evolving Machine Learning/Deep Learning models, assembling datasets, training and testing models, setting up data pipelines, integrating models and components, reusing pre-developed models, managing multiple models, and data quality management. This project theme is to explore new solutions to address challenges that are unique to AI Engineering, including AI architectures, interpretability, representation, scalability and verification and validation for AI assurance. If you are interested in this project theme, please feel free to contact me, and we can discuss to formulate a specific project in this theme that you are keen to work on.