

## Experience

Development of an automated tool for detecting C/C++ software vulnerabilities

### Centre for Research on Software Engineering Technologies

Mar 2021 – Oct 2021 | Python, Docker, PyTorch / PyTorch Lightning

- Conceptualised and implemented an automated software vulnerability detection tool for C/C++ code focused on usability and explainability. The tool leveraged graph neural network architectures to outperform the state-of-the-art model by 104%.
- Hin, D.**, Kan, A., Chen, H. and Babar, M.A., 2021. LineVD: Statement-level Vulnerability Detection using Graph Neural Networks. *Under Review*.

Development of an automated pipeline for software vulnerability assessment in Java

### Centre for Research on Software Engineering Technologies

Jun 2020 – Jan 2021 | Python, Java, Keras/Tensorflow

- Designed an automated software vulnerability assessment pipeline for Java code using deep learning, achieving 50% higher accuracy and requiring 6.3x less time to train compared to baseline models.
- Le, T.H., **Hin, D.**, Croft, R. and Babar, M.A., 2021. DeepCVA: Automated Commit-level Vulnerability Assessment with Deep Multi-task Learning. In *Proceedings of the 36th IEEE/ACM International Conference on Automated Software Engineering (CORE A\*)*

Development of web application for tracking of vulnerable software components

### The University of Adelaide

Mar 2020 – Nov 2020 | React, Node.js, Express, MongoDB, Google Cloud Platform, Docker, HTML5/CSS3

- Built and deployed a microservice-based backend and front-end web application for innovatively tracking and analysing vulnerable software components.
- Awarded \$10,000 by the Cybersecurity Cooperative Research Centre.
- This project achieved the highest mark for final year Honours project for Bachelor of Engineering (Software) at the University of Adelaide (2020).

Analysis and visualisation of online security vulnerability discussions

### Centre for Research on Software Engineering Technologies

Jan 2020 – Mar 2020 | Python, SQL, Scikit-Learn, Docker

- Processed >50GB of data from StackExchange and applied topic modelling to get insights on the key types of vulnerability discussion topics being discussed by developers
- Le, T.H., Croft, R., **Hin, D.** and Ali Babar, M.A., 2021. A Large-scale Study of Security Vulnerability Support on Developer Q&A Websites. In *Evaluation and Assessment in Software Engineering (CORE A)*

Development of interactive visualisation-based application for spectroscopy analysis

### Centre for Nanoscale BioPhotonics

Jul 2018 – Feb 2019 | R, R Shiny

- Created an app to analyse data collected from custom built biological autofluorescence spectroscopy equipment, involving manipulation of raw signal data, unsupervised learning, and dimension reduction techniques.

## Skills & Competencies

### Software Development

Python C C++ Java Node.js  
React SQL Ruby Git  
Firebase Amazon Web Services  
Google Cloud Platform

### Data Science

Pandas Scikit-learn R  
Deep Learning PyTorch/Tensorflow  
High-performance computing (HPC)

### Soft skills

Cross-team collaboration Mentoring  
Project management Presentation skills

## Education

Bachelor of Engineering (Software) with First-class Honours

### University of Adelaide

Feb 2017 – Dec 2020 | GPA: 6.8/7

## Achievements

- 2021** - Cybersecurity CRC PhD Top-Up Scholarship
- 2020** - Lifelenz Prize, for achieving the highest Honours mark in Bachelor of Engineering (Software)
- 2020** - Cybersecurity Cooperative Research Centre Honours Scholarship
- 2020** - University of Adelaide: Executive Dean's Award for Academic Excellence
- 2019** - Cybersecurity Cooperative Research Centre Summer Scholarship
- 2018** - Australian Oracle User Group Prize, for achieving highest score in Web and Database Computing course
- 2018** - University of Adelaide: Executive Dean's Award for Academic Excellence
- 2017** - University of Adelaide: Executive Dean's Award for Academic Excellence
- 2016** - Dux of The Heights School, SA
- 2015** - Govhack: International Digital Humanities Hack, N3xGen South Australian Champion