DAVID HIN

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Experience

Centre for Research on Software Engineering Technologies

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

📅 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

📅 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*)

Analysis and visualisation of online security vulnerability discussions

📅 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 security-related text classifier from online discussions

📅 Oct 2019 – Jan 2020 | 🔧 Python, Scikit-Learn, Docker

- Used machine learning, deep learning, and natural language processing techniques to classify and interpret real-world security-related posts from StackOverflow and the StackExchange network, constructing the largest publicly-available dataset for online security-related discussions.
- Awarded $10,000 by the Cybersecurity Cooperative Research Centre.
- Le, T.H., **Hin, D.** , Croft, R. and Babar, M.A., 2020. PUMiner: Mining Security Posts from Developer Question and Answer Websites with PU Learning. In *2020 IEEE/ACM 17th International Conference on Mining Software Repositories (MSR). IEEE.* (CORE A).

Summary

I am an experienced data scientist with a strong foundation in software engineering principles. My projects address real-world problems across areas as diverse as software security, biology, and computer vision. They demonstrate my expertise in software development, encompassing web, mobile, and desktop-based applications. Many of these projects have been published in peer-reviewed literature, highlighting my ability to see projects to completion while working with different teams. I am seeking an opportunity where I can continually improve my engineering practices and find new ways to optimise complex tasks.

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

The University of Adelaide

Supervision of summer projects

📅 Nov 2020 – Feb 2021 | 🔧 Python, React, Express, Node.js, Google Cloud Platform

- Conceptualised and oversaw two 12-week summer projects based on web application development, web scraping, and deployment of machine learning technologies.
- Final deliverables completed on-time and received great feedback from both the students and funder.

Development of web application for tracking of vulnerable software components

📅 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).

Exploration of deep style transfer in images

📅 Dec 2018 – Jan 2019 | 🔧 Python, Matlab

- Leveraged covariance matrix adaptation evolution to transfer high-level image and style features from one image to another, using Python/Keras and Matlab.
- Work done under Adelaide Summer Research Scholarship (ASRS) program (awarded $1,200).
- Alexander, B., **Hin, D.**, Neumann, A. and Ull-Karim, S., 2019, December. *Evolving pictures in image transition space. In International Conference on Neural Information Processing (pp. 679-690). Springer, Cham.* (CORE B)

Centre for Nanoscale BioPhotonics

Development of interactive visualisation-based application for spectroscopy analysis

📅 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.

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