Luhan Cheng

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Profile

As a computer science (Honours) graduate, I'm interested in applying computational approach to scientific problems that have significant impact upon our society.
I have experience in variety of topics including High-performance computing, machine learning, numerical optimization, game theory and multi-agent reinforcement learning.
I recently joined the PhD program at Centre for Information Resilience (CIRES), Swinburne University, working on applying natrual language processing and machine learning to create a pathway for automated knowledge mining from scientific articles and invention patents

Education

Swinburne University, Melbourne Nov 2022 – Present

PhD Candidate
This PhD project will involve the application of natural language processing and machine learning algorithms to identify patents and research papers that are semantically similar to a given query document, as well as topic modelling to identify technology gaps.

Monash University, Melbourne Feb 2020 – Nov 2020

Bachelor of Computer Science (Honours)
I use game theory and reinforcement learning to design algorithms whose main property is emergent cooperation and coordination. Thesis title: "Reinforcement Learning with Inequity Averse Preferences for Cooperation and Coordination". GPA3.5/4 WAN79.

Monash University, Melbourne Feb 2018 – Nov 2019

Bachelor of Computer Science
Been Awarded with Faculty of IT merit scholarship. GPA3.5/WAN79

Monash College, Melbourne Feb 2017 – Nov 2017

Diploma of Information Technology

Work Experience

Faculty of Information Technology, Monash University, Melbourne Jun 2021 – Nov 2022

Teaching Associate

I was working as tutor for the following units

- FIT3143 - Parallel Computing
- FIT2004 - Algorithms and Data Structure
- FIT2014 - Theory of Computation
- FIT2102 - Programming Paradigms

Monash eResearch Center, Monash University, Melbourne Jun 2019 – Sep 2022

Junior High Performace Computing Consultant (HEW level 6)

I undertake the responsibilities of managing high performance clusters at Monash University. Including providing user support, conducting system analysis, design and maintenance as required.
During my time at MeRC, I developed

- Slurm job submission monitoring tools using on top of the PySlurm
- Continuous integration pipeline for automatic cluster provision tools using Ansible and OpenStack.
- Automated testing pipeline for the software stack.

I'm in collaboration with MCEM (Monash Center of Electron Microscopy) designing optimized data processing pipeline for large-volume image datasets.

Commonwealth Scientific and Industrial Research Organization, Clayton, Melbourne Nov 2018 – Feb 2019

Vacation Student Individual Project

I was working on a deep-learning project that applies and integrates state-of-the-art bayesian neural network uncertainty estimation method to the crystallography image classification pipeline.

Skills

- **Programming Languages**
  - Experienced: python, bash, C
  - Familiar: Java, SQL, TypeScript/JavaScript, R, Haskell, Minizinc, MIPS, Matlab, Mathematica
- **Machine Learning**
  - PyTorch, TensorFlow, JAX
- **High Performance Computing/Cloud Computing**
  - Linux system administration
  - Container orchestration using Singularity and Docker
  - Experience with deploying cloud infrastructure using terraform
  - System provisioning using Ansible

Competition

Student Cluster Competition Nov 2018

Participated in student cluster competition in Supercomputing conference at Dallas, Taxes 2018, as member of Monash university team, which was the only team from Australia.
I was responsible for optimizing High-Performance Conjugate Gradient (HPCG) benchmark.

Extra-Curricular Activity

Monash DeepNeuron Jan 2020 – Dec 2020

HPC Branch Lead

My responsibilities as HPC branch lead at Monash DeepNeuron involves:

1. Managing day-to-day activities in HPC branch, including leading the weekly training, providing technical advice and liaison with researchers.
2. Coordinating with the rest of executive team to organize workshops and delivering public presentations/training events.

In the technical side, I'm responsible for developing reproducible, scalable and robust ML training pipeline for Microscopium project which aims to help researchers explore large collections of images, specifically in high content screening using generative models.

Monash Data Fluency Jul 2019 — Feb 2020

Co-Instructor

I helped Monash Data Fluency delivered numerous workshops including

- Introduction to High-performance Computing and Linux
- Introduction to TensorFlow and Deep Learning
- Deep Learning for Natural Language Processing

Additional skills

I speak native Mandarin and proficient English. I'm also a 4 dan (amateur) Go player.