Hayden Lee

Software Research Engineer – Defence Science and Technology Group

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CONTACT

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Personal Portfolio Website: https://haydensflee.github.io/HaydenLee.github.io/resume.html

PROFILE

Software Engineer – Mechatronics Engineering and Computer Science (AI Major) background. Proficient with C++, Python, Tensorflow, QML to build functional software in a fast-paced, agile environment. Comprehensive knowledge of data structures and algorithms, and design patterns. Thrives under self-direction and team environments. Demonstrated strengths in following scrum process to see delivery of projects from stakeholder needs analysis through to design, development/testing. Strong at building rapport, and adaptive communication styles to establish solid teamwork foundation and foster collaboration. Foundational knowledge in Cybersecurity, including vulnerability scanning and network/pen testing.

EDUCATION

University of Adelaide
2018 – 2022
6.50 GPA & First Class Honours

BACHELOR OF ENGINEERING (HONOURS) (MECHATRONIC)

BACHELOR OF MATHEMATICS AND COMPUTER SCIENCE (AI MAJOR)

SKILLS

Python, C++, Tensorflow, Java basics

Artificial intelligence and Machine Learning background.

Fluent with industry standard design patterns.

Systems Engineering concepts and project management.

Data structures and algorithms

CERTIFICATES

- ***Commonwealth Bank Software Engineering Virtual Experience***
- ***Commonwealth Bank Introduction to Cybersecurity***

EXPERIENCE

Software Engineer | DSTG (2023 – Present)

- Deployed a **Docker** development environment for **cross compiling** Qt source code onto the Jetson Nano, allowing for streamlined development by allowing team members to work inside a containerised environment.
- Research/technical note detailing contemporary generative AI audio models, including Google's **WaveNet** and **AudioLM**.
- Used Tensorflow to develop a **Generative Adversarial Network** and tune parameters for synthetic audio data generation.
- Leveraged Qt Framework to build a message logging system to record simulation events. Improved memory efficiency by storing messages as byte objects, and demonstrated **OOP concepts** to develop byte-parsing interface.
- Developed **Qt3D** GUI to visualise simulation scenario to support future torpedo simulation activities. Reduced simulation system complexity by **implementing a subscriber design pattern** via a custom abstract item model/view control architecture.
- Collaborated with team members from project planning to executing effective git version control processes to provide technical support and communication.
- Worked in an **agile environment** and followed the **scrum process** to develop and maintain software systems.

STEM Cadet – Analyst | DSTG (2021 – 2023)

- Supported DST's commitment to the joint heavyweight torpedo development by developing in-house software tools and undertaking simulation and analysis tasks in accordance with stakeholder plans and requirements.
- Directed and delivered a Monte Carlo study using design of experiments techniques to analyse statistical variance in torpedo performance, understand torpedo decision-making and behaviours, and build domain knowledge.

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ACHIEVEMENTS

2021 Honours Project – Bio-inspired Cave eXploration (CaveX) Robot
MAXMINE Prize for Outstanding Technical Engineering

2019-2022 Recipient of Defence Science Technology Group (DSTG) Cadetship

2019 2nd place Warman Design and Build Challenge at the University of Adelaide

2018 Recipient of Commonwealth Scholarships Program for South Australia

REFERENCES

Details provided on request

Mr. Andrew May (DSTG SED; Discipline Lead – Torpedo Analysis and Simulation | Undersea Systems)

Dr. Anthony Fowler (DSTG MD; Maritime Platform Dynamics and Control Specialist |Hydroacoustics)

GITHUB

https://github.com/haydensflee

- *Distributed Decision Making Algorithm Simulation*
- *Tictactoe AI*
- *Chess OOP project*
- *Decision Tree Learning*
- *Pagerank implementation*
- *Iris flower k-means clustering*

EXPERIENCE

STEM Cadet – Dynamics and Control Specialist | DSTG (2020 – 2021)

- Developed a submarine manoeuvring mathematical simulation model in MATLAB/Simulink by studying literature and hydrodynamic mathematical laws.
- Performed model verification by comparing with DSTG manoeuvring model performance from their Hydroacoustics capability.

Undergrad Systems Engineer | University of Adelaide (2020 – 2021)

- Supported design of the Australian Research Experimental Submarine (ARES) at the University of Adelaide by developing the onboard control system.
- Engaged with stakeholders to generate system requirements to lead control system and control surfaces design, and produced working depth-keeping proof of concept.
- Delivered technical specification and justification report for control system and control surfaces design.

PROJECTS

Distributed Decision Making Simulation System

- Created an application platform for testing distributed decision making algorithms.
- Practised leading a nine person team using agile methodologies as Scrum Master by fostering collaboration, facilitating team meetings, and guiding the project direction.
- Developed the frontend GUI as team lead by creating an event-driven application that displayed a spatial visualisation of the testing scenario with interactable agent parameters.

CaveX Hexapod

- Provided a solution to industry stakeholders at the Naracoorte Caves by designing and building a cave mapping robot hexapod.
- Enabled robot vision by implementing simultaneous localisation and mapping (SLAM) algorithms using LiDAR technologies.
- Developed walking gaits for the hexapod that allowed it to traverse unsteady cave terrain using robot dynamics and inverse kinematics of the chassis and legs.