Nick Sullivan

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About Me

Software Engineer with a Ph.D. in robotic task allocation. Specialist in back-end software (Python), cloud infrastructure (AWS), and agile development.
Professionally interested in automating solutions to challenging problems (that magic moment where it just ***works***), and helping others make great things. I'm always looking for ways to improve.

Employment

MAY 2021 | **Technical Team Lead**
MAXMINE
Leading a small team of developers responsible for data reporting, feature maintenance, and IoT monitoring. Performed architecture design and implementation for a Data Lake and Data Warehouse using Snowflake, Terraform, and dbt. Duties included product prioritisation, project planning, stakeholder management, code reviews, and guiding team career growth.

2019-2021 | **Software Engineer**
MAXMINE
Processing mining equipment sensor data to classify operator behaviours, minesite conditions, and tracking material movements. Developed software to provide insight on how to improve minesite operations by reducing fuel usage, improving tyre life, and predicting equipment failures. Also introduced data quality testing to the product, performed as scrum master, and recruited/managed a team of students to generate truth sets and execute small projects.

2016-2019 | **Contractor**
THE UNIVERSITY OF ADELAIDE
- Automated a laser guided pacing system for the Australian Olympic track cycling team.
- Enabled autonomous operation of small sensor-laden vehicles for defence research.
- Tutor for fourth year engineering courses Advanced PID Control and Advanced Digital Control.

Education

2016-2019 | **Ph.D. in Robotics**
THE UNIVERSITY OF ADELAIDE
Supervisors: Assoc. Prof. Steven Grainger and Prof. Ben Cazzolato
My research was on task allocation and collaborative localisation for ground vehicles; designing algorithms that decide how individuals should complete their objectives, while remaining within line-of-site of one another.
- Partnered with DST Group's Advanced Vehicle Systems team.
- Presented my research to Australia's Minister for Defence Industry and Chief Defence Scientist, as well as conferences ACRA 2017, ACRA 2018, and ICARCV 2018.
- Published four journal papers.

2010-2015 | **B.Eng. in Mechatronics and Comp Sci (Hons)**
THE UNIVERSITY OF ADELAIDE
Honours Project - An Autonomous Ground Vehicle | Supervisor: Dr. Tien-Fu Lu
6.5/7 GPA

Expertise

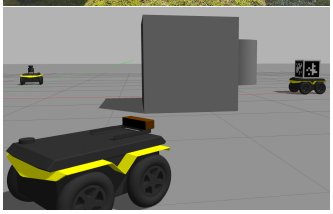
EXPERIENCED: AWS (Solutions Architect), Python, Linux, MATLAB, Terraform
A BIT RUSTY: Airflow, Android, C++, dbt, Eagle, Java, OptiTrack, PHP, ROS, SQL

Projects

2020 **Site Visits**

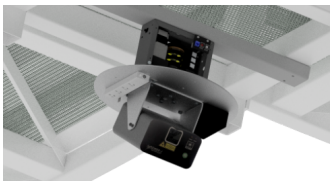
Performed diagnostics at two Australian minesites. They are week-long analysis deep dives to work out what the biggest opportunities are, their potential value, and push the site to start using data-driven improvement methodologies.
Minesites are notorious for their distrust in data, so accuracy, clarity, and empathy were incredibly important. And I got to ride around in enormous trucks!

2018 **Clearpath Jackals**



These are the vehicles I used in my Ph.D. research, in collaboration with Defence Science Technology Group (DST Group).
We upgraded the base Clearpath Jackal with inter-robot detection capabilities using cameras and recognisable markers. I provided sensor driver improvements, navigation, and localisation.
Simulations were executed on the University of Adelaide's high performance compute cluster to develop and verify algorithms before applying them on real hardware.

2018 **Velodrome Laser**



I was contracted by the South Australian Sports Institute (SASI) to implement pace guidance using a spinning projector. This required signal noise reduction, latency profiling, control theory, and a bit of maths (the projector wasn't in the centre!)

2017 **YujinRobot Kobukis**

These are the first vehicles I used in my Ph.D. research. A number of Kobukis were used as part of hardware-in-the-loop experiments in multi-robot localisation. I attached Raspberry Pi's running Robot Operating System (ROS), and tracked the robots in real-time using OptiTrack cameras.

2014 **Autonomous Ground Vehicle Challenge**

My first major robotics project with a few other class mates. We learned a lot about image processing, localisation, system integration, and project management.