Nick Sullivan

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About Me

Software engineer, Ph.D., with strong mathematical and data skills. I specialise in back-end software (Python/C#), cloud infrastructure (AWS), and algorithm design. I'm passionate about product-minded engineering, including automation and data analytics. I'm an Australian currently looking to immerse myself in the UK.

Employment

2021-Now

Senior Software Engineer

Tiimely

- Rapidly became a domain expert in the automation of home loan lending policies and validation of customer financials, translating between product and technical domains to improve project success.
- Recognised that an existing service would not scale to meet the business strategy, redesigned and convinced the business to prioritise the project, and led a team of engineers in implementation. This reduced cyclometric complexity by 40% and resulted in 60% reduction in server costs and 90% reduction in development time for new features.
- Mentored software engineers and quality assurance engineers in testing best practice, introducing frameworks and processes which restored an at-risk client relationship.
- Balanced tactical decisions for immediate business outcomes with a strategic migration from a monolithic architecture to microservices using domain-driven development.
- Upskilled the team in clean code principals through code reviews, pair programming, and whitepapers.
- C#, AWS, SQL, Typescript, Playwright

2019-2021

Software Engineer / Team Lead

MaxMine

- Developed algorithms such as haul route optimisation, operator performance gamification and material tracking, while dealing with intermittent site connectivity, clock-skew, and heterogeneous fleets.
- Used these algorithms to automate reporting on operational opportunities to clients, contributing to client improvements such as 75% decrease in tyre spend, 16% reduction in truck queuing, and compliance with safe driving practices.
- Reverse engineered communication protocols used by Komatsu and Hitachi to discover new data sources, which unlocked the ability to determine load unit orientation. This data improved the quality of the material tracking product.
- Recognised a gradual increase in data quality issues as the company client list grew by 300%. Introduced and implemented data testing frameworks, processes, and dashboards which significantly improved data quality and restored client confidence.
- Promoted to technical lead after two years, where I managed and mentored a team of 5, and recruited new engineers.
- Led the design and implementation of an Analytics Data Store, which reduced ad-hoc analysis time from hours to seconds, saving engineering time and providing the business access to faster decision making.
- Balanced tactical priorities for immediate business outcomes with a strategic migration from Matlab to Python.
- Python, AWS, Terraform, Matlab, dbt

2016-2019

Contractor

The University of Adelaide

- Improved the Australian Olympic track cycling team's pacing through an automated laser guided pacing system.
- Enabled autonomous operation of small sensor-laden vehicles for defence research.
- Tutored fourth year engineering courses Advanced PID Control and Advanced Digital Control.
- Python, C++, ROS, Matlab

Education

2016-2019 | **Ph.D. in Robotics**

The University of Adelaide

Researched new methods for 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.

- Presented my research at conferences ACRA 2017, ACRA 2018, and ICARCV 2018, as well as to Australia's Minister for Defence Industry and Chief Defence Scientist.
- Published four journal papers to top quartile journals.

2010-2015 | **B.Eng. in Mechatronics and Comp Sci (Hons)**

The University of Adelaide

- 6.5/7 GPA.

Certifications

2021 **AWS Certified Solutions Architect - Associate**

Publications

N. Sullivan, **Task Allocation and Collaborative Localisation in Multi-Robot Systems**, *Ph.D Thesis*, 2019

N. Sullivan, S. Grainger, B. Cazzolato, **Analysis of cooperative localisation performance under varying sensor qualities and communication rates**, *Journal of Robotics and Autonomous Systems*, 2018

N. Sullivan, S. Grainger, B. Cazzolato, **Sequential Single-Item Auction Improvements for Heterogeneous Multi-Robot Routing**, *Journal of Robotics and Autonomous Systems*, 2019

N. Sullivan, S. Grainger, B. Cazzolato, **A dual genetic algorithm for multi-robot routing with network connectivity and energy efficiency**, *International Conference on Control, Automation, Robotics and Vision* (ICARCV 2018)

N. Sullivan, S. Grainger, B. Cazzolato, **Algorithms for Multi-Robot Routing with Adaptive Heterogeneity**, *Journal of Heuristics*, 2018

N. Sullivan, S. Grainger, B. Cazzolato, **Formation-based multi-robot routing with inter-robot distance constraints**, *European Journal of Operational Research*, 2018

N. Sullivan, G. Pearce, S. Grainger, B. Cazzolato, **An outdoor multi-vehicle platform for collaborative localisation research**, *Australasian Conference on Robotics and Autonomation* (ACRA 2018)

N. Sullivan, S. Grainger, B. Cazzolato, **Robot heterogeneous multi-robot routing for low-intelligence agents**, *Australasian Conference on Robotics and Autonomation* (ACRA 2017)

Other Projects

I create small projects to explore new technologies and try out different architectures. My go-to tools are a combination of Python, Flutter, AWS, Terraform, and GitHub actions. Some notable projects include a Android app that overlays QR codes on GIFs, a realtime interactive dice game, and an entry to an autonomous ground vehicle challenge. See my website for more information.