Resume of Sean Taylor

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PROFILE

I am an experienced robotics engineer with practical skills in designing, developing and deploying advanced robotics systems and automation solutions. I am passionate about bringing together practical engineering, innovation and software to improve the way we live and interact with our environment.

I pride myself on being a quick learner with an interest in acquiring new skills and self development. This is shown through my experience in developing and maintaining control software and systems in C/C++ and Python on Linux and QNX, designing and implementing firmware and, in my free time, tinkering with electronics.

I am skilled in collaborating across multidisciplinary teams to deliver scalable and robust robotic solutions.

Key capabilities

- Robotic software development
- Firmware development
- Structure from motion
- System design
- AI/ML integration
- Broad understanding of various communication interfaces
- Hardware
- Team work
- Troubleshooting
- Communication
- Independence

EDUCATION

University of Technology Sydney Sydney, NSW

Bachelor of Engineering (1st class honours), major in Mechatronics 2015 - 2020

Bachelor of Arts in international studies (Chile)

TECHNOLOGY SUMMARY

Systems:	**Linux (ubuntu, centos7), QNX, Windows 7/10**
Databases:	SQLite
Languages:	C, C++, Python, Structured Text, LISP, Bash, SQL
Software:	ROS, ROS2, Docker, Git, JIRA, Confluence, Bitbucket, QNX SDK

Employment History

Abyss Solutions Sydney, NSW

Senior Robotics Engineer 2023 – current

At Abyss we are pioneering autonomous inspection across land, sea, air and space. I am based in the robotics team as the primary robotics software resource, but also assist with hardware design, development and integration. Our team develops and maintains robotics systems and processes to capture high resolution data for a world class ML defect detection pipeline.

Key Responsibilities

- Software development, primarily in python and ROS/ROS2
- System and process design
- Assisting with managing the direction of the technology
- Testing new systems
- Maintaining deployed systems
- Photogrammetry for accurate 3D Reconstructions

Key Contributions

- I joined the team at an exciting time, we were developing an autonomous system to inspect the newly constructed Thames Tideway Tunnels. I was primarily responsible for building the software stack and assisting with hardware integration for this system and joined the team for an in person trial in London.

  Follow (https://abysssolutions.co/case-studies/thames-tideway-tunnel-project/) to read more.

- Porting the existing software stack from ROS to ROS 2
- Designing and integrating a new automated processing pipeline to consume drone imagery and Terrestrial laser scanner (TLS) data to produce 3D meshes of assets using photogrammetry
- Upgrading the custom imagery software to extend the current systems to handle 7 machine vision cameras simultaneously

University of Technology Sydney Sydney, NSW

Senior Technical Officer 2022 – 2023

At UTS I worked within the school of Mechanical and Mechatronic engineering as a research engineer. Based at the Tech Lab campus I collaborated with a small team of skilled engineers to design and develop various automated systems for client projects.

Key Responsibilities

- Software development low and high level in C++ for ROS
- Systems integration
- Testing, including field testing
- Mechatronic design

Key Contributions

- I was involved in the design and development of the second generation Fast Off Road Vehicle (FORV). Using ROS we implemented a full control stack for the autonomous four wheeled independent drive rover. We also integrated a full suite of sensors including; lidar, multisense, imu/gps, cameras and encoders. Some of the

key work included; implementing a custom routine to decode SPI communications from a high accuracy encoder, Building a HardWare interface layer inside the ROS-Control stack for motor controller communication over CAN, Implementing a PTP server for system time sync, Building out the Gazebo simulation, Modifying and implementing a four wheel steering controller.

- I led the implementation of a robust start-up procedure for the first generation Fast Off Road Vehicle (FORV) research rover. This fixed some timing issues that were causing failed start-ups and utilised the onboard PLC to perform some system checks after initial power application to alert the user once the system was ready to receive commands. It also added an additional safety layer, preventing any commands until the system was in a good state.
- Assisted with implementing the control and HMI for an automated wool skirting machine. I was also involved with the successful presentation of the project to the Australian Wool Industry board.

Kalmar Global Sydney, NSW

Machine Automation Engineer - cargo-handling 2019 – 2022

I managed projects independently for equipment and process automation at Kalmar, developing and maintaining high level control software for automated Australian ports.

Key Responsibilities

- Software development in C and C++ (offboard and onboard)
- Testing
- On-call port troubleshooting
- Liaise with clients and internal stakeholders to develop products

Key Contributions

- Primarily responsible for the development, testing and commissioning of control software for the Rail Management System (RMS), handling the automation of Rail Mounted Gantries (RMGs) for a world-first fully automated rail handling operation. This system after initial launch was performing at 30% above projected performance
- Working with an international team we developed a lightweight simulator for the AutoStrads™ using the Gazebo physics engine, this allows onboard software to be run on any developer's laptop within a realistic simulated environment. This compliments the previously developed Hardware In Loop (HIL) simulator as the first stage in the integration testing pipeline allowing for remote simulation of operations and improved software development lifecycle
- Developing software and investigating issues with the AutoStrad onboard software
- Developed a unit test framework using Gtest to support the development of RMS. I believe in a Test-driven Development approach. This framework has since been expanded to other modules and processes in the system including much legacy code
- Perform on-call support for live port operations, and engage in maintenance work and bug fixes in all aspects of the system

References on request.