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 combining engineering innovation and software to enhance human interaction with technology. I am a problem solver and a quick learner, eager to take on new challenges.

I am skilled in developing control software and systems in C/C++ and Python on Linux and QNX. I have broad experience in designing and implementing firmware as well as prototyping with hardware. I pursue continuous learning through hands-on projects with a wide array of interests.

I am adept at collaborating across multidisciplinary teams, and I deliver scalable and robust robotic solutions.

Key capabilities

- Software development
- Firmware development
- Structure from motion
- System design
- AI/ML integration
- Hardware
- Team work
- Leadership
- Troubleshooting
- Communication

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 using 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

- Collaborated with a multidisciplinary team to developed an autonomous robot to navigate larger sewer tunnels and capture high resolution data[1]
- Integrated an AI processing pipeline to analyse the sewer data and build an accurate 3D reconstruction
- Ported existing software stack from ROS to ROS2
- Designed and integrated a new automated processing pipeline to consume drone imagery and Terrestrial laser scanner (TLS) data to produce 3D meshes of assets using photogrammetry
- Upgraded 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). An autonomous four wheel independent drive rover

[1] https://abysssolutions.co/case-studies/thames-tideway-tunnel-project/

- Using ROS + Docker we implemented a full control stack plus software lifecycle management for FORV, integrating a full suite of sensors (LIDAR, multisense, IMU/PGS, cameras, encoders)
- Developed firmware for a custom routine to decode SPI communicators for a high accuracy encoder
- Built a Hardware interface layer in the ROS-Control stack for motor controller communications over CAN
- Implemented a PTP server for system time sync
- Designed Gazebo simulation for development of the steering controller
- Led the implementation of a robust start-up procedure utilising the onboard PLC to perform system checks and transition the system into a ready 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 and cargo handling equipment.

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[2]
- 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.
- 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.

[2] https://www.youtube.com/watch?v=UTtilF53L3k