BEAU HOBBA

I'm hardworking and deeply committed to any project I undertake. I have a talent for leading teams and creating complex systems.

My passions lie in automation, everyday assistive robotics, AI, earth/space exploration, agriculture and ethical robotics. I am a firm believer that robotics are a central part of our futures and are fascinated by their ability to assist our everyday lives. I wish to use my programming expertise to help develop technology which is yet to be discovered.

My hobbies include flying drones, making video edits, playing board games, making music, trying to document every Australian animal and mountain biking.

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EDUCATION

2016 to 2020 **The University of Sydney**

Bachelor of Engineering Honours (Mechatronics), First Class Honours

SIGNIFICANT PROJECTS

2024 Smart Traffic Lantern Construction

I led the design and delivery of 2 seperate intersections of smart traffic lantern infrastructure at FMTRC, developing embedded systems including fibre optics and sensor integration to support future Cooperative Intelligent Transport Systems (C-ITS) and AI capabilities. I produced detailed engineering drawings (lantern locations, trenching, line marking), prepared all documentation, coordinated procurement, and managed stakeholder engagement across construction, testing, and safety teams. I secured internal funding, oversaw dynamic on-site decision-making, and ensured compliance with NSW traffic standards. The project has since driven research collaborations, established a new research and revenue stream for FMTRC and promoted by media and ministerial teams.

STAKEHOLDER ENGAGEMENT, WHS, ENGINEERING DESIGN AND INNOVATION, NETWORKING, C-ITS, PROJECT AND CONSTRUCTION MANAGEMENT, TECHNICAL DOCUMENTATION, STANDARDS COMPLIANCE, TRAFFIC PERSONALITIES, INTERSTATE COLLABORATION

2023 to 2025 Streamlined Reporting Tools

Designed and developed a suite of Python/VBA tools to support vehicle safety testing, streamline workflows, and ensure compliance with key standards and protocols.

- **MME Reporter**: Automated conversion of test data into ISO/TS 13499 format, enabling EURO NCAP compliance and expanding service opportunities.
- **Video Converter**: Eliminated manual video labelling, saving up to one day per programme and supporting high-definition recording with mainstream cameras.
- **Report Creator:** Automated report generation of hundreds of pages of appendices and tables from raw test logs, reducing turnaround time from one week to under two days and increasing team autonomy.
- **Haptic Feedback Analysis Tool**: Delivered a custom analysis tool for Lane Safety Assist testing, providing advanced filtering, peak detection, and batch reporting beyond proprietary capabilities.
- **Testing Log**: Developed and maintain a centralised testing, quoting, and invoicing platform, embedding version control, stakeholder feedback, and operational updates.

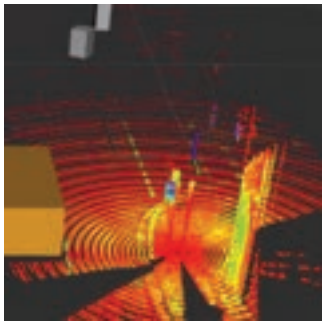
These tools have significantly optimised FMTRC's testing processes, improved turnaround times and enabled new commercial opportunities.

PYTHON, VBA, SIGNAL ANALYSIS, PROCESS AUTOMATION, TOOL AND SYSTEM DESIGN, OPERATIONAL SUPPORT, STANDARDS COMPLIANCE

2024 to 2025 C-ITS Initiatives/Projects

Serving as the lead technical SME for C-ITS at FMTRC, I have built key relationships nationally and led critical initiatives supporting C-ITS testing, deployment, and research harmonisation across Australia.

- **National Haromisation of C-ITS**: Initiated collaboration with AIMES group and acted as FMTRC's Technical SME, supporting development of C-ITS test programmes and integration strategies.
- **Localisation Systems in GNSS Denied Environments**: Provided technical SME support for C-ITS-based localisation testing in GNSS-denied tunnel environments, including system design feedback, software review, bench testing, hardware design and field test coordination.
- **TMR Cloud Facility Integration**: Led technical delivery to connect FMTRC systems to Queensland's C-ITS cloud facility, supporting cybersecurity testing and early national interoperability aligned with ETSI standards.
- **Intelligent Traffic Ligh Demos**: Led installation of intelligent pedestrian countdown timers and thermal camera bicycle detection systems.



TECHNICAL LEADERSHIP, PROJECT MANAGEMENT, STAKEHOLDER ENGAGEMENT, C-ITS, STANDARDS, ROS2

24/25 Initiatives

Inventory Management: Tool developed using Power BI/Automate to track, log, and manage inventory detailing component locations and preventing depletion issues.
Daily Tracker: Power Automate tool delivering daily task summaries and weather updates, ensuring events are logged and enhancing team awareness.
NTRIP Caster: Established a server providing GNSS RTK corrections over the internet, allowing clients to access high-accuracy corrections without deploying robotic testing equipment.
Wireless Network Setup: Designed and deployed a PTMP wireless network to enhance communications infrastructure across the test track, used currently by the security camera system.
LiDAR CPM Creator: Established ROS2 network and edge computing workflows to stream LiDAR data and integrate PointPillars object detection for future sensor testing and AI development.
Autonomous Camera Tracking: Project managing (***AGILE***) autonomous vehicle tracking using the wireless offboard camera and GPS traces, reducing manual camera operation and enhancing test efficiency.
NCOM Data Collection: Python based script to capture NCOM data from test vehicles in real-time, enabling more automated detection and logging of test runs.
Traffic Lantern Publisher and Subscriber: Engineered a mechatronics solution to remotely trigger traffic lights via GPS or road strips for C-ITS testing, with integrated data logging and time synchronisation.
Pale Pavements/AI Animal Detection: FMTRC Technical SME for trials deploying AI, sensors, and road treatments to improve wildlife detection and visibility, supporting road safety/conservation.
ANU Sun Racer: Led FMTRC site operations for the ANU Solar Racing team's dynamic testing, supporting vehicle validation for the World Solar Challenge.
EV Recovery Trailer: Led FMTRC test planning for an EV recovery trailer project, coordinating WHS documentation, test plans, equipment procurement, and stakeholder engagement.
CAREFUL Buses: Supported hardware selection and test planning of initiatives enhancing school bus safety through child detection and collision prevention.
PRISCILLA: Led FMTRC testing for Road Safety's PRISCILLA safety platform, delivering successful hardware installation, collision trials, and data capture on a bus.

Chippendale C-ITS Project

2024 *to* 2025

Led the planning, execution, and reporting of C-ITS testing at FMTRC in collaboration with SCATS and ACFR, validating Red Light Violation Warning (RLVW), Time to Green Warning (TTGW), and Pedestrian Turn Warning (PTW) technologies. Managed end-to-end operations including infrastructure setup, multi-agency coordination, real-time testing, data acquisition, post-processing, and stakeholder reporting. Delivered a complete testing programme that strengthened FMTRC's capability for future mobility research and positioned it as a national leader in connected vehicle testing.

PROJECT MANAGEMENT, C-ITS, REPORTING, DATA COLLECTON, POST PROCESSING, TEST DESIGN, COLLISION TESTING, SYSTEM DESIGN, PRODUCT DEVELOPMENT, RESEARCH

Data Analytics

2022 *to* 2025

I have become a key figure in performing data analytics for the Future Mobility branch in Transport for NSW. Projects have included creating geographic data for council comparisons, comparing electric vehicles, understanding testing capabilities, analysising AI platforms, looking into vehicle destination behaviour and creating research articles for autonomous and connected vehicles. Various tasks have required online hosting for displaying the data to various teams.

PYTHON, PANDAS, NUMPY, PLOTLY, WEB SCRAPING, MATPLOTLIB, REACT, DATA ANALYSIS

Roost

2023 *to* 2025

I created my own card game for a Kickstarter campaign. Developed the associated website Roostgame.com. Used AWS Amplify, Dynamo DB, App Sync, Route 52 and the AWS CLI. Prototyped multiple versions for the final product. Worked with manufacturers to create a viable copy, play-tested with various demographics and initiated a marketing campaign with an international audience. Created ALL artworks with Adobe Illustrator, Photoshop and Dall-E. Product is now sold via Amazon and a Shopify Deployment.

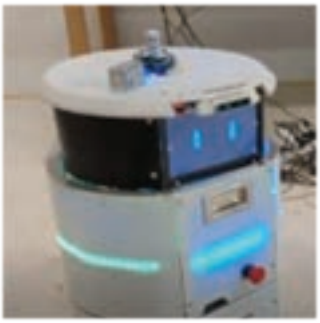
WEBSITE, AWS, ADOBE, ILLUSTRATOR, PHOTOSHOP, REACT, GOOGLE ANALYTICS, PROTOTYPING

Inspector Robot / Robot Brick

2020 *to* 2022

Designed, constructed and produced software for an AI-driven robot for NASA JPL (whilst at AKIN AI) in a team of 5 people.
My role was lead Mechatronics Engineer, and I designed all embedded systems. The robot could perform person identification, ambient environmental monitoring, emotion and fatigue detection, navigation, actuation, speech recognition and object detection. I also created a multimodal artificial intelligence engine that can take different unique inputs and respond to embedded outputs, developed backend support for an interactive web application and led the development of Robot Brick, an ambient environmental monitoring robot.

ROS2, MICROROS, SENSORS, ACTUATORS, PYTHON, C, C++, RPI, ELEECTRONICS, SYSTEM DESIGN, TENSORFLOW/KERAS/SK LEARN, PID CONTROL, COMPUTER VISION, LEADERSHIP, AGILE, ARDUINO/TEENSY, ASSEMBLY, FLASK, API, JAVASCRIPT, REACT NATIVE, PyQT, Sphinx



Herbicide Mapping

2020 *to* 2021

Finished a publication on "Efficient Herbicide Spray Pattern Generation for Site-Specific Weed Management Practices using Semantic Segmentation on UAV Imagery". Accepted and presented this paper at the Australian Robotics and Automation conference.
Used semantic segmentation and UAV data to detect, classify and geolocate common weeds on a rural property. Kinematics were determined to find the location of weeds according to latitude and longitude.
Computer vision techniques were used to improve the results of the semantic segmentation techniques.

KINEMATICS, UAV CONTROL, SEMANTIC SEGMENTATION, TENSORFLOW/KERAS, CV, GEOTAGGING, MATLAB, PYTHON, C/C++, GOOGLE COLAB

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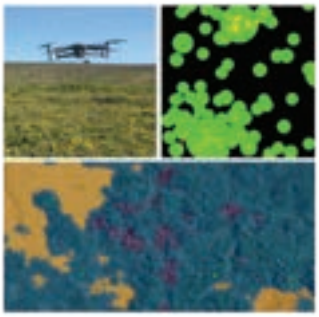


BEAU HOBBA

SKILLS

- Python
- C/C++
- Microcontrollers
- ROS/ROS2
- Systems Design
- CV
- Embedded Electronics
- TensorFlow
- Agile
- React JS
- Data Analytics

References

References available on request

Peter.S — *TFNSW, Operations Manager*

Stephen.L — *AKIN-AI Mechatronics Intern (Under me)*

Neesam.J — *AKIN-AI CIO*

Alexander.H — *AKIN-AI AI Specialist*

Daniel.W — *AKIN-AI Mechnical Engineer*

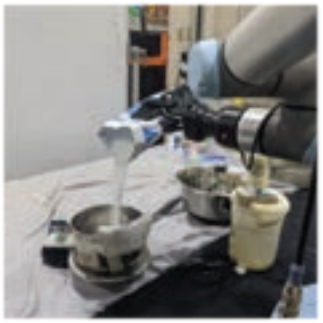
Jack.S — *AKIN-AI Electrical Engineer*

Robert.S — *TFNSW Graduate (Under me)*

2020 to 2022 **Robotatouille**

This role involved working with 2 other individuals to program a robotic arm to cook simple meals.
This project involved robotic arm movement using the UR-5 robotic arms, various sensors, ROS interfacing, kinematics to work out the location of ingredients, a custom machine learning model (where we labelled thousands of pictures), custom 3D arm effector prints, and a GUI to create/run recipes.
The robot could stir meals, measure ingredients (using a countertop scale), pick up different utensils, collect an ingredient (using kinematics/coordinate transforms and path planning), and move items around a kitchen bench.

ROS, 3D PRINTING, ROBOTIC ARMS, UR5-E, PyQT, SENSORS, MACHINE LEARNING (KERAS/TENSORFLOW), KINEMATICS, INTEL REALSENSE, PATH PLANNING



2020 **Robotic Bar**

This role involved working with a team of 2 other individuals to program a 'robotic bar' to promote the new Heineken 0.0, zero-alcohol beer. This full-on role involved robotic arm movement using the UR-5 robotic arms, various sensors, person detection using machine learning, an automated conveyor system, ROS interfacing and a surplus of analog I/O electrical wiring. We worked directly with a marketing team, creating various on-the-spot changes to the robot to finalise a pair of robots for a week-long activation period.

UR5-E, ROBOTIC ARMS, PYTHON, ROS, INTEL REALSENSE, MACHINE LEARNING, ELECTRONIC DESIGN

2021 to 2022 **PyChat**

Designed and created a chat system to handle chat flows with users in a team of 2 people (whilst at AKIN AI). My role was lead software developer, and I used tensorflow/keras to develop machine learning algorithms that could handle matching user text prompts to an associated response. Chat-based emotion detection was additionally added.
The platform was API callable and retrained itself on different machine learning models.

TENSORFLOW/KERAS/SK LEARN, PYTHON, JAVA, FLASK API, SPHINX

EXPERIENCE

2023 **TFNSW** Project Officer (Mechatronics Engineer)

- Assisted with testing of vehicles fitted with robotic apparatuses for ANCAP testing
- Data processing of robotic vehicle channel data. Involved creating reports and graphs with Python. Worked extensively on C-ITS and sensor based applications.
- Worked on geographic maps and models for vehicle statistics relevant to NSW (Python/Plotly/Geopandas)

2020 **AKIN AI** — *Senior Intern Advisor / Project Manager (Internship)*

2021 — *Junior Complex Mechatronics Engineer*

2021 to 2022 — Mechatronics and Software Engineer

- Developed and designed robots to assist JPL (NASA) and people with disabilities
- Managed two teams of 4 people
- Lead software developer/integrator of robotics
- System designer of embedded stack of robot, creator of multimodal AI system, assist with chat-based AI

2019 to 2020 **Bioscout** Engineering Intern

- Helped create agriculture-based hardware and software to detect airborne diseases in real time
- Involved in testing sensors, integration testing components, setting up online documentation and debugging

2020 **Heineken** Contracted Robotics Engineer

- Created a temporary robotic bar to promote the new Heineken 0.0 zero alcohol beer.
- Worked in a team of 3, involving robotic arm, movement, sensors, person detection and an automated conveyor system.

2023 **Roost Games** Owner, Designer, Creator

2018 to 2020 **IGLU** Resident Leader

EXTRA CURRICULAR

- Sydney University Mechatronics Society (SUMO) - Marketing Officer (2019)
- Zero Robotics Mentor
- INCUBATE member - entrepreneur business creation program
- Bronze Medallion in Duke of Edinburgh, Rotary Youth of the Year
- Breed and show chickens, I-Naturalist Contributer
- Event Manager of Millennial Society (2018)