

DR. ALEXANDER JAMES D. MCGREGOR

Robotics Mechanical Hardware Engineer

@ AlexanderJDMcGregor@gmail.com

☎ (+61) 0451690607

📍 Perth, WA

in [linkedin.com/in/alexandermcg](https://www.linkedin.com/in/alexandermcg)

PROFILE

I am currently a Mechanical Engineer in the Hardware Team at Advanced Navigation. I have an Engineering Doctorate in Robotics for Non-Destructive Evaluation from Strathclyde University sponsored by Eddyfi Technologies, and previously completed a MEng in Mechanical Engineering with Financial Management with distinction from Strathclyde University. I enjoy the challenge of finding real world solutions to difficult problems.

EDUCATION

Engineering Doctorate in Robotics for Inspection - EngD

Strathclyde University

📅 Sep 2016 – Dec 2021

📍 Glasgow, UK

- Doctorate on the development of a robotic positioning algorithm for inspection of pipes using accelerometers.
- Deployment of probabilistic sensor fusion algorithms to increase the accuracy of state estimation in a robotic positioning context.
- Matlab, C# and Python coding languages used throughout.
- Undertook various NDE courses as part of the RCNDE. Including Machine Learning for Acoustics, Data Science in Python and Signal Processing.

Mechanical Engineering with Financial Management - MEng

Strathclyde University

📅 Sep 2011 – Aug 2016

📍 Glasgow, UK

- Masters group project developing and prototyping a micro-turbine to generate electricity at pressure reduction stations in the gas network.
- Undertook a year studying in Spain with all classes in Spanish, obtaining a B2 level of Spanish.
- Dissertation on structural health monitoring of self-reinforcing composite materials using vibrational analysis.
- Dissertation on the implications of finance and the economy on engineering in industry.

Highschool - International Baccalaureate

American British Academy

📅 Sept 2009 – Aug 2011

📍 Muscat, Oman

- 36 IB points.

PUBLICATIONS, PRESENTATIONS AND POSTERS

BINDT Conference

📅 Sep 2020

Title: Mobile Robotic Positioning for Pipe Inspection with Sensor Fusion

IEEE Sensors Journal

📅 Jan 2020

Title: Determining Position and Orientation of a 3-Wheel Robot on a Pipe Using an Accelerometer
doi: 10.1109/JSEN.2020.2964619

AIP QNDE Conference Proceedings

📅 Jul 2019

📍 Burlington, Vermont, US

Title: Mobile Robot Positioning Using Accelerometers for Pipe Inspection
doi: 10.1063/1.5099794

RCNDE Annual Conference Presentation

📅 May 2018

📍 Bristol, UK

Title: Determining Orientation and Position on a Pipe using an IMU

BMVA Computer Vision Poster

📅 Jul 2018

📍 Norwich, UK

Title: Robot Positioning on a Pipe Using Gravity

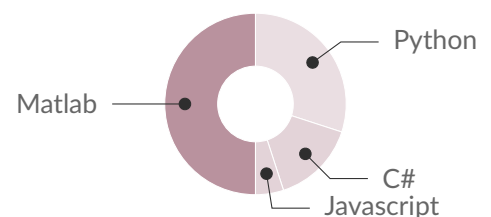
Rolls Royce EngD Conference Poster

📅 Dec 2017

📍 Derby, UK

Title: Intelligent Crawler Robots for NDE

PROGRAMMING LANGUAGES



WORK EXPERIENCE

Mechanical Engineer

Advanced Navigation

📅 Mar 2022 - Present

📍 Perth, AU

- Working on the mechanical design of underwater AUVs
 - Using Solidworks for designing parts and managing complex assemblies
 - Work closely with the electrical and software teams to come up with innovative solutions in the subsea space
 - Scope out work packages and work with the Product and Project teams to determine engineering requirements
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Algorithm and Measurement Solutions Engineer

Siemens Mobility

📅 Jun 2021 - Mar 2022

📍 Perth, AU

- Designed laser and camera units for condition monitoring of the public transport system to be installed at the Los Angeles Airport
 - CAD using Inventor for the mechanical design for laser/camera calibration and validation systems
 - Simulated and experimental validation of measurement concepts through rendering laser lines and capture of real image data to determine measurement accuracy of prototype systems.
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Student Researcher

Eddyfi Technologies

📅 Sep 2017 - Aug 2020

📍 Swansea, UK

- Coded scripts in Python, C# and MatLab to clean and analyse data. I also characterised and tested various sensors and equipment for robotic positioning purposes.
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Rotating Equipment Intern

Royal Dutch Shell

📅 Jun - Sept 2015

📍 Rijswijk, NL

- Literature and patent review of alternative compression technology as well as thermodynamic analysis and calculations for alternative compression technology.
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Assistant Technician

Sonovation

📅 Aug 2013

📍 Oosterhout, NL

- Aided to develop ultrasonic testing procedures and prepare samples for stainless steel welds inspection.
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REFERENCES

References available on request.