

SAMI ARJA

Software Engineer Research Assistant ML Developer

☎ +61 424403034

✉ sami.arja@gmail.com

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EDUCATION

Master of Philosophy in Neuromorphic Engineering (Scholarship) September 2019 - September 2021

Thesis: Neuromorphic Perception in Greenhouse Technology using

Event-based Vision Sensors

International Center of Neuromorphic Systems (ICNS)

The MARCS Institute

Western Sydney University, Werrington

Bachelor of Engineering in Robotics and Mechatronics (Honours) 🎓 February 2015 - June 2019

Thesis: Deep Convolutional Neural Network for Human Activity Recognition

Western Sydney University, Kingswood

Honour Class II Division I

Diploma in Engineering 🎓 February 2014 - December 2015

Western Sydney University, Nirimba

SKILLS AND INTERESTS

**Programming Language
Software**

Python, Javascript, C#/C++, Matlab, VB, SQL

Solidworks, SW Visualizer, ROS, Altium Designer, Jupyter Lab/Notebook, AWS/Azure

MS-excel, Google Docs and L^AT_EX

Interests

Machine Learning, Computer vision, Electronics Systems, Biomedical Devices,
Neural Networks, Statistics, Data science, Cloud engineering, Robotics,
3D Modeling and Simulation

PUBLICATIONS

Journal Article

- El Arja, S.; Jayarathna, T.; Naik, G.; Breen, P.; Gargiulo, G. Characterisation of Morphic Sensors for Body Volume and Shape Applications. *Sensors* 2020, 20, 90. [Paper](#)

Conference Proceeding

- S. E. Arja, T. Jayarathna, F. Ulloa, G. Gargiulo and P. Breen, "Characterization of Coated Piezo-resistive Fabric for Respiration Sensing," 2019 International Conference on Electrical Engineering Research Practice (ICEERP), SYDNEY, Australia, 2019, pp. 1-6, doi: 10.1109/ICEERP49088.2019.8956989. [Paper](#)

EXPERIENCE

Software Engineer Intern

May 2019 - Present

🏢 *Nautitech Mining Systems Pty Ltd*

- Build linux based web and desktop application development with C# for thermal Cameras.
- Large database design and development using MS SQL Server.
- Build video compression applications to convert between different protocols (e.g. GIGe, H.264).
- Build application using OpenCV for image processing.
- Develop Javascript application to visualize sensors output on the browser.
- Write engineering technical documentations using MS-word and latex.

Assistant Technical Support Officer

February 2019 - Present

🏢 *Western Sydney University, Engineering & Industrial Design Cluster*

- Assist technical officers across the electrical, electronics, Mechatronics & Mechanical team.
- Assist in lab preparation for classes, basic maintenance duties, moving and managing equipment's.
- Supporting students in running undergrad lab equipment's.

Undergraduate Researcher


November 2018 - Present

 *The MARCS Institute Brain, Behavior and Development*

- Project: Characterisation of morphic sensors for body volume applications.
- Supervisors: Dr. Gaetano Garguilo and Dr. Paul Breen.
- Characterizations of electro-resistive fabrics band to be used in measuring human blood and respiration rate.
- Implement an accurate data acquisition system on the CC2460R2 module which helps in recognizing patterns for each band during testing.
- Using C and Matlab to support the data acquisition, Data analysis and Data visualization.
- 3D modelling an optimized version of the expansion/contraction machine.
- Paper Title: "Characterization of Morphic Sensors for body volume and shape applications".

Research Assistant


May 2018 - May 2019

 *CSIRO's Data61*

- Conduct an online research analysis to understand more about business.
- Review, edit and enter data about Australian businesses providing Environmental Goods and Services.
- Classify these Data into specific categories, for further analysis.
- Use Pandas and Numpy to merge old and new data effectively without losing any entry and perform Data cleaning and Data Munging.
- Update data already collected against primary sources, as well as identifying and recording data about other relevant organizations.

Robotics Class Instructor

May 2018 - Present

 *RobotZilla - Baulkham Hill Public School*

- Teach kids the principle of coding on Scratch Junior - MIT App Inventor, as well as web development on Python - HTML - CSS - JavaScript.
- Help Kids to build and program their own Lego Robot.
- Design robotics kit to support the annual curriculum, such as Robotics arm, quadruped robot and Robotics arm.
- Platforms used are Scratch, MIT App Inventor, Arduino and Lego Mindstorm.

Robotics Engineer Intern


October 2017 - January 2018

 *Lab38 - Western Sydney University*

- Design a CNC drawing machine using mechanical linear rail to support a frictionless movement.
- Program the electrical system of the machine to convert any input (image, text) to G-code.
- Laser cut all parts and components using Corel software, and Solidworks as main program for 3D modelling.

Electronics Engineer Intern

December 2017 - March 2018

 *Mostyn Enterprises*

- Design Circuit boards on Altium Designer.
- Generate BOM for each board.
- Design RF(Radio Frequency) Loop Antenna & bias tee.

PROJECTS

Deep Convolutional Neural Network for Spatial and Temporal Human Action Recognition

August 2018 - June 2019

Thesis - Honour project (High Distinction)

- Develop a software to extract spatial and temporal features from trimmed video on KTH datasets.
- Build 2 neural network architecture and compare their performance against the state of the art benchmark results.

Fully Autonomous Mobile Robotics system based on Neural Network

August 2018 - June 2019

Major final year Capstone project (Distinction)

- Model a mobile robot platform that run on raspberry pi and arduino uno and hokuyo Lidar.
- Develop a software based on convolutional neural network architecture that detect and recognize traffic light and objects in real time.

RobotCup SSL(Small size League)

November 2017

Western Sydney University Unlimited Robotics

- Design and build a robotics soccer team consists of 11 mobile robots.
- Use industrial camera to detect each robot pattern and teach the robot to play as team.

NI (National Instruments) Autonomous Robotics Competition

December 2017 September 2018

Western Sydney University Unlimited Robotics

- Integrate sensors and actuators into a smart mechatronic system.
- Develop an algorithm to perform image processing and motion planning
- Develop navigation and mapping algorithm navigation through tracking features or landmarks within the track.

POSITION OF RESPONSIBILITY

Baxter Robot Operator

February 2018 - Present

The LaunchPad

- Operate and present Baxter Robot in various event: CatalystWest, Semi-permanent, CeBIT.

Engineer Team Member

August 2017 - Present

Robotics Club - Western Sydney University

- Lead in Mechanical work of Robotics club, working mostly with CAD and Hardware systems.
- Active member working to develop various robots of different concepts and configurations.

ACHIEVEMENTS

- 🏆 Top 5 at **NIARC 2018** under the supervision of Professor Gu Fang. March 2018
- 🏆 Top 25% at **Santander Value Prediction Challenge**, a Machine Learning competition hosted by **Kaggle**. May 2018
- Leading workshop on **Introduction to Robotics and Lego Mindstorm**.
at Western Sydney University October 2018