

Russel Shawn Dsouza

CONTACT INFORMATION	Belgrave View 1 Belgrave Middleway Birmingham B5 7AJ	rshwndsz@gmail.com rshwndsz.github.io   rshwndsz
EDUCATION	Master of Science, Artificial Intelligence & Machine Learning University of Birmingham	2022 – 2023
	Bachelor of Technology, Electronics & Communications Engineering National Institute of Technology Karnataka, India	8.57 2017 – 2021
	K-12 Little Rock Indian School, India	X: 10.0, XII: 95.6% 2004 – 2017
SKILLS	Languages: Python, Java, C++, C, SQL, JavaScript, Go, Rust, MATLAB Frameworks: PyTorch, Keras, OpenCV, scikit-learn, Numeric & Scientific Python Web Dev: NodeJS, ExpressJS, postgresSQL Tools: git, Docker, bash, vim, Linux Hardware: Verilog, ngSPICE, Arduino, Xilinx Artix	
RESEARCH INTERESTS	Real-Time Computer Vision for Augmented Reality Image and Video Retrieval, Neural Hashing	
RESEARCH EXPERIENCE	Research Intern CMInDS and CSRE, IIT Bombay May 2021 – Sep 2021 <ul style="list-style-type: none">– Designed & developed novel model variants with vision transformers & CNNs for the multi-modal, pixel-wise classification of land-use from hyperspectral & LiDAR satellite imagery.– Improved model search times with state of the art Bayesian hyperparameter optimisation. Winter Research Intern Deep Learning Lab, NIT Karnataka Dec 2020 – Mar 2020 <ul style="list-style-type: none">– Implemented state of the art models and set up data pipelines for nuclear segmentation in histopathology images of kidney and liver tissues.– Collaborated on the detection of Urothelial Carcinoma from whole slide images of bladder tissues with average dimensions of 80000×50000.– Built an open-source project benchmarking segmentation models on histopathology datasets.– Presented a report reviewing the different methods to perform nuclear segmentation. Summer Research Intern Deep Learning Lab, NIT Karnataka May 2019 – Jul 2019 <ul style="list-style-type: none">– Refined and modernised efficient implementations of classical image processing algorithms on large datasets.– Revamped and maintained data pipelines for deep learning based image segmentation and classification models.– Conducted in-depth literature surveys and reproduced results from seminal papers in the field of automated histopathology.	
WORK EXPERIENCE	Frontend Developer and UI Designer IRIS, NIT Karnataka Aug 2018 – Apr 2019 <ul style="list-style-type: none">– Debugged and maintained parts of the frontend code at IRIS — The official student portal.– Created a new UI system from the ground up in Figma.– Developed the design system in Vue.js and worked on integration with the legacy Rails code. Python Developer Pinnacle Media, Manipal, Karnataka May 2018 – Jul 2018 <ul style="list-style-type: none">– Deployed real-time face detection and recognition, using OpenCV, dlib, and scikit-learn, on a Raspberry Pi as a part of an ‘employee attendance’ system.	

BACHELOR'S THESIS	Low Light Image Enhancement on Low Power Devices	19/20
	Advisor: Dr Ramesh Kini	Aug 2020 – May 2021
	<ul style="list-style-type: none"> – <i>Objective</i>: Design of hardware and software-optimized algorithms to capture vibrant and detailed low-light photos with inexpensive camera sensors without the use of obtrusive flashlights. – Optimised the network to have just 79416 parameters and require just 5.21 GFlops of compute for a $256 \times 256 \times 3$ image. – Redesigned the entire image processing pipeline on the edge device in C++ to reduce latency and memory. 	
NOTABLE PROJECTS	Fashion Discovery for Video Commerce	Oct 2021 – Mar 2022
	<ul style="list-style-type: none"> – Researched the “Exact street-to-shop” i.e. matching products in consumer images to those in manufacturer catalogues - a cross-domain image-based image retrieval problem. – Pitched the prototype software to a popular short-video platform in India. 	
	Change detection in SAR images	Feb 2021 – May 2021
	<ul style="list-style-type: none"> – Developed a multi-sensor, multi-modal algorithm for change detection in bi-temporal Synthetic Aperture Radar (SAR) images and presented findings in a report as part of a course-project. 	
	Multi-lingual speech enhancement	Feb 2021 – May 2021
	<ul style="list-style-type: none"> – Improved the quality and intelligibility of noisy speech recordings by upto 30% using deep neural networks that generalize over multiple out of sample languages. – Reported findings that improved upon the state of the art in intelligibility without a significant drop in quality. 	
	Information extraction from PDFs	Apr 2021
	<ul style="list-style-type: none"> – Developed a program to detect tables and extract information embedded in the table cells, as a part of a system to automate the summarisation of insurance policies. 	
	Muon Physics	Mar 2020 – Jun 2020
	<ul style="list-style-type: none"> – Conceptualised and programmed a custom model to classify muon momenta trained on monte-carlo simulated data from the Cathode Strip Chambers at the CMS experiment of the Large Hadron Collider at CERN. 	
	Segmentation of brain tumours in MRI images	Dec 2019
	<ul style="list-style-type: none"> – Reproduced state of the art semantic segmentation models in Keras/TF to segment brain tumours and surrounding edema from MRI images with upto 83% accuracy. – Presented results on multi-class segmentation with a custom model variant on the BRATS dataset as part of a workshop on medical imaging. 	
	Detecting Ponzi schemes in blockchain smart contracts	Aug 2019 – Sep 2019
	<ul style="list-style-type: none"> – Designed a custom model to classify smart contracts deployed on the Ethereum blockchain into 16 categories using CNNs and stacked auto-encoders, in under 48 hours as a part of a coding sprint. – Used the raw bytecode of smart contracts mined from the blockchain using Google BigQuery, publicly available Solidity source code of popular smart contracts, and a publicly available dataset of 184 known Ponzi schemes. 	
	Predicting truth level of news articles	Jul 2019 – Aug 2019
	<ul style="list-style-type: none"> – Built a model to classify news articles into 6 different categories based on the truth level and justifications provided by trusted news sources. 	
HONOURS	Offered the Australian National University Chancellor’s International Scholarship to pursue the Master of Computing at ANU’s School of Computing.	
	Selected as a full-time research intern at the Robert Bosch Center for Cyber-Physical systems, Indian Institute of Science, Bangalore , India’s top research university, to work on “Simultaneous Localization And Mapping - SLAM”.	
	Selected for a funded research internship at the Haute école du paysage, d’ingénierie et d’architecture de Genève, Haute Ecole Spécialisée de Suisse occidentale, Geneva to work on “NavTrack: A portable obstacle tracker for the rehabilitation of spatial neglect”.	