

Russel Shawn Dsouza

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EDUCATION	Master of Science, Artificial Intelligence & Machine Learning University of Birmingham, UK	2022 – 2023
	Bachelor of Technology, Electronics & Communications Engineering National Institute of Technology Karnataka, India	2017 – 2021
	K-12 Little Rock Indian School, India	2004 – 2017
SKILLS	Languages: Python, Java, C++, C, SQL, JavaScript, Go, Rust, MATLAB Frameworks: PyTorch, Keras, OpenCV, scikit-learn, Numeric & Scientific Python 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, India May 2021 – Sep 2021 <ul style="list-style-type: none">– Designed and developed model variants for multi-modal, pixel-wise classification of land-use from hyper-spectral and LiDAR satellite imagery with vision transformers and CNNs.– Improved model peak-performance by over 10% through the use of state-of-the-art Bayesian hyper-parameter optimisation. Winter Research Intern Deep Learning Lab, NIT Karnataka, India Dec 2020 – Mar 2020 <ul style="list-style-type: none">– Implemented cutting-edge models and established high-performance data pipelines for nuclear segmentation in histopathology images of kidney and liver tissues.– Collaborated on the detection of <i>Urothelial Carcinoma</i> from whole slide images of bladder tissues with an average size of 4 billion pixels.– Created an open-source project to benchmark segmentation models on histopathology datasets, resulting in improved reproducibility and standardisation of results.– Presented a comprehensive report reviewing the state-of-the-art methods for nuclear segmentation in histopathology, providing valuable insights and recommendations for future research. Summer Research Intern Deep Learning Lab, NIT Karnataka, India May 2019 – Jul 2019 <ul style="list-style-type: none">– Revamped and maintained high-performance data pipelines for deep learning-based image segmentation and classification models, resulting in improvements in accuracy and processing speed.– Streamlined classical image processing algorithms for large datasets, achieving a 20% reduction in processing time in some cases.– Conducted extensive literature surveys and reproduced state-of-the-art results from seminal papers in automated histopathology, contributing to the lab's cutting-edge research.	
WORK EXPERIENCE	Frontend Developer and UI Designer IRIS, NIT Karnataka, India Aug 2018 – Apr 2019 <ul style="list-style-type: none">– Debugged and maintained critical parts of the front-end code at IRIS, the official student portal with over 10k daily active users– Created a new, streamlined UI system from the ground up in Figma.– Developed the design system in Vue.js and spearheaded the integration of JavaScript with legacy Rails code.	

BACHELOR'S THESIS	Low Light Image Enhancement on Low Power Devices	19/20
	Advisor: Dr Ramesh Kini	Aug 2020 – May 2021
NOTABLE PROJECTS	<ul style="list-style-type: none"> – Designed hardware- and software-optimised algorithms to capture vibrant and detailed low-light photos with inexpensive camera sensors, without using obtrusive flashlights. – Optimised the neural network to have less than 100k parameters and require only about 5 GFlops of compute for a 256×256 colour image, resulting in a 35% reduction in model size and a 20% improvement in processing speed. – Redesigned the entire image processing pipeline on the edge-device using C++, resulting in a 10% reduction in latency and a 50% reduction in memory usage. 	
	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 top-3 short-video platform in India. 	
	Multi-lingual speech enhancement	Feb 2021 – May 2021
	<ul style="list-style-type: none"> – Developed a deep neural network to improve the quality and intelligibility of noisy speech recordings by up to 30%, even in out-of-sample languages. – Conducted extensive experiments on a large dataset of diverse languages and noise types, demonstrating that our approach outperforms state-of-the-art methods in terms of intelligibility without sacrificing quality. 	
	Information extraction from PDFs	Apr 2021
	<ul style="list-style-type: none"> – Developed a program to extract information embedded in table cells within PDFs with upto 70% accuracy, as part of a system to automate summarising 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
HONOURS	<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 and developed a custom model using CNNs and stacked auto-encoders to accurately classify smart contracts deployed on the Ethereum blockchain into 16 categories, delivering results in under 48 hours for a coding sprint. – Trained the model on raw bytecode of smart contracts extracted from the blockchain using Google BigQuery, publicly available Solidity source code of popular smart contracts, and a dataset of 184 known Ponzi schemes. 	
	Predicting truth level of news articles	Jul 2019 – Aug 2019
	<ul style="list-style-type: none"> – Developed a novel model using natural language processing techniques to accurately classify news articles into 6 categories based on the truth level and justifications provided by trusted news sources. 	
	<p>Offered the Australian National University Chancellor’s International Scholarship to pursue the Master of Computing at ANU’s School of Computing.</p> <p>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 Localisation And Mapping - SLAM”.</p> <p>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”.</p>	