

# Russel Shawn Dsouza

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CONTACT INFORMATION	Belgrave View 1 Belgrave Middleway Birmingham B5 7AJ	rsd259@student.bham.ac.uk rshwndsz.github.io · rshwndsz@gmail.com  github.com/rshwndsz ·  rshwndsz
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	<b>Languages:</b> Python, Java, C++, C, SQL, JavaScript, Go, Rust, MATLAB <b>Frameworks:</b> PyTorch, Keras, OpenCV, scikit-learn, Numeric & Scientific Python <b>Web Dev:</b> NodeJS, ExpressJS, postgresSQL <b>Tools:</b> git, Docker, bash, vim, Linux <b>Hardware:</b> Verilog, ngSPICE, Arduino, Xilinx Artix	
RESEARCH INTERESTS	Real-Time Computer Vision for Augmented Reality Image and Video Retrieval, Neural Hashing	
RESEARCH EXPERIENCE	<b>Research Intern</b> CMInDS and CSRE, IIT Bombay, India <span>May 2021 – Sep 2021</span> <ul style="list-style-type: none"><li>– Designed &amp; developed novel model variants with vision transformers &amp; CNNs for the multi-modal, pixel-wise classification of land-use from hyperspectral &amp; LiDAR satellite imagery.</li><li>– Improved model search times with state of the art Bayesian hyperparameter optimisation.</li></ul> <b>Winter Research Intern</b> Deep Learning Lab, NIT Karnataka, India <span>Dec 2020 – Mar 2020</span> <ul style="list-style-type: none"><li>– Implemented state of the art models and set up data pipelines for nuclear segmentation in histopathology images of kidney and liver tissues.</li><li>– Collaborated on the detection of Urothelial Carcinoma from whole slide images of bladder tissues with average dimensions of <math>80000 \times 50000</math>.</li><li>– Built an open-source project benchmarking segmentation models on histopathology datasets.</li><li>– Presented a report reviewing the different methods to perform nuclear segmentation.</li></ul> <b>Summer Research Intern</b> Deep Learning Lab, NIT Karnataka, India <span>May 2019 – Jul 2019</span> <ul style="list-style-type: none"><li>– Revamped and maintained data pipelines for deep learning based image segmentation and classification models.</li><li>– Refined efficient implementations of classical image processing algorithms on large datasets.</li><li>– Conducted in-depth literature surveys and reproduced results from seminal papers in the field of automated histopathology.</li></ul>	
WORK EXPERIENCE	<b>Frontend Developer and UI Designer</b> IRIS, NIT Karnataka, India <span>Aug 2018 – Apr 2019</span> <ul style="list-style-type: none"><li>– Debugged and maintained parts of the frontend code at IRIS — The official student portal with over 10k daily active users: a diverse group of students, professors and administrators.</li><li>– Createad a new, streamlined UI system from the ground up in Figma.</li><li>– Developed the design system in Vue.js and spearheaded the integration of JavaScript with legacy Rails code.</li></ul> <b>Python Developer</b> Pinnacle Media, Karnataka, India <span>May 2018 – Jul 2018</span> <ul style="list-style-type: none"><li>– 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.</li></ul>	

BACHELOR'S THESIS	<b>Low Light Image Enhancement on Low Power Devices</b>	19/20
	Advisor: Dr Ramesh Kini	Aug 2020 – May 2021
	<ul style="list-style-type: none"> <li>– <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.</li> <li>– Optimised the network to have just 79416 parameters and require just 5.21 GFlops of compute for a <math>256 \times 256 \times 3</math> image.</li> <li>– Redesigned the entire image processing pipeline on the edge device in C++ to reduce latency and memory.</li> </ul>	
NOTABLE PROJECTS	<b>Fashion Discovery for Video Commerce</b>	Oct 2021 – Mar 2022
	<ul style="list-style-type: none"> <li>– 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.</li> <li>– Pitched the prototype software to a top-3 short-video platform in India.</li> </ul>	
	<b>Change detection in SAR images</b>	Feb 2021 – May 2021
	<ul style="list-style-type: none"> <li>– 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.</li> </ul>	
	<b>Multi-lingual speech enhancement</b>	Feb 2021 – May 2021
	<ul style="list-style-type: none"> <li>– Improved the quality and intelligibility of noisy speech recordings by upto 30% using deep neural networks that generalize over out of sample languages.</li> <li>– Reported findings that improved upon the state of the art in intelligibility without a significant drop in quality.</li> </ul>	
	<b>Information extraction from PDFs</b>	Apr 2021
	<ul style="list-style-type: none"> <li>– Developed a program to extract information embedded in table cells within PDFs with upto 70% accuracy, as part of a system to automate the summarisation of insurance policies.</li> </ul>	
	<b>Muon Physics</b>	Mar 2020 – Jun 2020
	<ul style="list-style-type: none"> <li>– 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.</li> </ul>	
	<b>Segmentation of brain tumours in MRI images</b>	Dec 2019
	<ul style="list-style-type: none"> <li>– 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.</li> <li>– Presented results on multi-class segmentation with a custom model variant on the BRATS dataset as part of a workshop on medical imaging.</li> </ul>	
	<b>Detecting Ponzi schemes in blockchain smart contracts</b>	Aug 2019 – Sep 2019
	<ul style="list-style-type: none"> <li>– 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 for a coding sprint.</li> <li>– Trained the model on 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.</li> </ul>	
	<b>Predicting truth level of news articles</b>	Jul 2019 – Aug 2019
HONOURS	<ul style="list-style-type: none"> <li>– Fashioned a model to classify news articles into 6 different categories based on the truth level and justifications provided by trusted news sources.</li> </ul>	
	Offered the Australian National University Chancellor’s International Scholarship to pursue the Master of Computing at ANU’s School of Computing.	Mar 2022
	Selected as a <b>full-time research intern</b> 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”.	July 2020
	Selected for a <b>funded research internship</b> 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”.	Mar 2020