

Russel Shawn Dsouza

CONTACT INFORMATION	National Institute of Technology Karnataka NH66, Srinivasnagar, Surathkal, Mangalore Karnataka, India 575025.	rshwndsz@gmail.com rshwndsz.github.io  in rshwndsz
RESEARCH INTERESTS	Real-Time Computer Vision for Augmented Reality Image and Video Retrieval, Neural Hashing	
EDUCATION	National Institute of Technology Karnataka (NIT-K) Bachelor of Technology, Electronics and Communication Engineering Little Rock Indian School, Brahmavara K-12	8.57 2017 – 2021 X: 10.0, XII: 95.6% 2004 – 2017
CAPSTONE PROJECT	Low Light Image Enhancement on Low Power Devices <i>Advisor: Dr Ramesh Kini</i> – Objective: 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. – Deployed serialised & optimised PyTorch model and developed image processing pipeline on edge device in C++ to work in Python-independent environments.	19/20 Aug 2020 – May 2021
RESEARCH EXPERIENCE	Research Intern, CSRE, IIT-Bombay <i>Advisor: Prof Biplab Banerjee</i> – Worked on multi-modal, pixel-wise land-use classification from hyperspectral & LiDAR satellite imagery. – Iteratively designed & developed novel model variants with vision transformers & CNNs and Bayesian hyperparameter optimisation. Winter Research Intern, Deep Learning Lab, NIT-K <i>Advisor: Dr Shyam Lal</i> – Implemented state of the art models and designed data pipelines for nuclear segmentation in histopathology images of kidney and liver tissues. – Worked on the detection of Urothelial Carcinoma from whole slide images (average dimensions of 80000×50000) of bladder tissues. – 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-K <i>Advisor: Dr Shyam Lal</i> – Designed and debugged efficient implementations of classical image processing algorithms on large datasets. – Developed and maintained data pipelines for deep learning based image segmentation and classification models. – Worked on reproducing results from seminal papers in the field of automated histopathology.	May 2021 – Aug 2021 Jan 2020 – Mar 2020
WORK EXPERIENCE	Frontend Developer and UI Designer IRIS, NIT-K – Debugged and maintained parts of the frontend code at IRIS — The official student portal. – Designed 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 – Built and 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.	Aug 2018 – Apr 2019 May 2018 – Jun 2018
RELEVANT SCORES	GRE - 163V 168Q 5A TOEFL - 30R 30W 30L 25S	

SKILLS	<p>Languages: Python, Go, C++, C, SQL, Rust, MATLAB, JavaScript, Verilog, SPICE</p> <p>Frameworks and packages: PyTorch, Keras, OpenCV, scikit-learn, Numerical Python</p> <p>Tools: git, Docker, bash/zsh, vim, Linux</p> <p>Hardware: Raspberry Pi, Arduino, Xilinx Artix 7 FPGA</p>
NOTABLE PROJECTS	<p>Fashion Discovery for Video Commerce <i>Sep 2021 – Present</i></p> <ul style="list-style-type: none"> – Solving 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. <p>Change detection in SAR images <i>Feb 2021 – May 2021</i></p> <ul style="list-style-type: none"> – Worked on developing a multi-sensor, multi-modal algorithm for change detection in bi-temporal Synthetic Aperture Radar (SAR) images. – Presented findings in a report as part of a course-project in <i>Image and Video Processing</i>. <p>Multi-lingual speech enhancement <i>Feb 2021 – May 2021</i></p> <ul style="list-style-type: none"> – Worked on improving the quality and intelligibility of noisy speech recordings using deep neural networks that generalize over multiple out of sample languages. – Presented findings that matched SOTA in certain areas and improved upon it in certain others. <p>Information extraction from PDFs <i>Apr 2021</i></p> <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. <p>Image Restoration <i>Jul 2020</i></p> <ul style="list-style-type: none"> – Reproduced a very deep persistent memory network to perform image restoration by removing noise and predicting uncorrupted images; achieved results comparable to the original paper. <p>Muon Physics <i>Mar 2020 - Jun 2020</i></p> <ul style="list-style-type: none"> – Designed a custom model to classify muon momenta trained on monte-carlo simulated data from the Cathode Strip Chambers at the CMS experiment of Large Hadron Collider at CERN. <p>Segmentation of brain tumours in MRI images <i>Dec 2019</i></p> <ul style="list-style-type: none"> – Reproduced state of the art semantic segmentation models in Keras/TFv1 to segment brain tumours and surrounding edema from MRI images – Presented results on multi-class segmentation with a custom model variant on the BRATS dataset as part of a workshop on medical imaging. <p>Detecting Ponzi schemes in blockchain smart contracts <i>Aug 2019 – Sep 2019</i></p> <ul style="list-style-type: none"> – Designed a custom model to detect Ponzi smart contracts deployed on the Ethereum blockchain using CNNs and stacked auto-encoders, in under 48h as a part of a coding sprint. – Trained the model on the raw bytecode of Ethereum smart contracts mined from the Ethereum blockchain using Google BigQuery, publicly available Solidity source code of popular smart contracts, and a publicly available dataset of known Ponzi schemes. <p>Predicting truth level of news articles <i>Jul 2019 – Aug 2019</i></p> <ul style="list-style-type: none"> – Built a model to classify news articles into 6 different categories based on their truth level. – Trained the model on the LIAR-PLUS dataset containing news articles and fact-checking justifications from trusted sources. <p>Space Time Adaptive Processing Radar <i>Apr 2019</i></p> <ul style="list-style-type: none"> – Simulated a radar implementing STAP in Matlab and presented a report on the current state of STAP in Radar Signal Processing.
MISC.	<p>Selected as a full-time research intern at the Robert Bosch Center for Cyber-Physical systems, IISc, Bangalore to work on “Simultaneous Localization And Mapping - SLAM”. <i>July 2020</i></p> <ul style="list-style-type: none"> – Offer refused due to conflicts with the university’s schedule in 2020. <p>Selected for a funded research internship at HEPIA-Hesge, Geneva, Switzerland to work on “NavTrack: A portable obstacle tracker for the rehabilitation of spatial neglect” <i>Mar 2020</i></p> <ul style="list-style-type: none"> – Offer rescinded due to pandemic-induced travel restrictions.