

Russel Shawn Dsouza

CONTACT INFORMATION	501A, Kirthi Solitaire Bannanje, Udupi Karnataka, India 576101	rshwndsz@gmail.com rshwndsz.github.io   rshwndsz
RESEARCH INTERESTS	Real-Time Computer Vision for Augmented Reality Image and Video Retrieval, Neural Hashing	
EDUCATION	National Institute of Technology Karnataka Bachelor of Technology, Electronics and Communications Engineering Little Rock Indian School K-12	8.57 2017 – 2021 X: 10.0, XII: 95.6% 2004 – 2017
FINAL YEAR PROJECT	Low Light Image Enhancement on Low Power Devices <i>Advisor: Dr Ramesh Kini</i> <ul style="list-style-type: none">– 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.– Trained, optimised, and deployed PyTorch models for de-blurring and low-light enhancement.– Built the entire image processing pipeline on edge device in C++ to reduce latency and memory.	19/20 Aug 2020 – May 2021
RESEARCH EXPERIENCE	Research Intern, CMInDS & CSRE, IIT Bombay <i>Advisor: Prof Biplab Banerjee</i> <ul style="list-style-type: none">– 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 Karnataka <i>Advisor: Dr Shyam Lal</i> <ul style="list-style-type: none">– 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 Karnataka <i>Advisor: Dr Shyam Lal</i> <ul style="list-style-type: none">– 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 – Sep 2021 Jan 2020 – Mar 2020 May 2019 – Jul 2019
WORK EXPERIENCE	Frontend Developer and UI Designer <i>IRIS, NIT Karnataka</i> <ul style="list-style-type: none">– 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 <i>Pinnacle Media, Manipal</i> <ul style="list-style-type: none">– 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, Java, C++, C, SQL, JavaScript, Go, Rust, MATLAB, Verilog, SPICE</p> <p>Packages: PyTorch, Keras, OpenCV, scikit-learn, Numeric & Scientific Python</p> <p>Tools: git, Docker, bash & zsh, vim, Linux</p> <p>Hardware: Xilinx Artix 7 FPGA, Raspberry Pi, Arduino</p>
NOTABLE PROJECTS	<p>Fashion Discovery for Video Commerce <i>Oct 2021 – Dec 2021</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 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” <i>Mar 2020</i></p> <ul style="list-style-type: none"> – Offer cancelled due to pandemic-induced travel restrictions.