

Russel Shawn Dsouza

CONTACT INFORMATION	National Institute of Technology Karnataka (NITK) NH66, Srinivasnagar, Surathkal, Mangalore Karnataka, India 575025.	russel.171ec143@nitk.edu.in rshwndsz.github.io   in rshwndsz
RESEARCH INTERESTS	Real-time Computer Vision, Augmented Reality, Low Power Computing	
EDUCATION	National Institute of Technology Karnataka (NIT Karnataka) Bachelor of Technology, Electronics and Communications Engineering	8.58 Jul 2017 – May 2021
RESEARCH EXPERIENCE	Research Intern, CSRE, IIT-Bombay Multi-modal Land-use Classification <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 using vision transformers & CNNs with Bayesian hyperparameter optimisation. Winter Research Intern, Deep learning lab, NIT Karnataka Computational Histopathology <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 Karnataka Image Processing and Deep Learning <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.	Jun 2021 – Aug 2021 Dec 2019 – Feb 2020 May 2019 – Jun 2019
WORK EXPERIENCE	Frontend Developer and UI Designer IRIS, NIT Karnataka – Debugged and maintained parts of the frontend code at IRIS — The official student portal of NIT Karnataka. – Designed a new UI system from the ground up in Figma. – Developed the design system in Vue and worked on an 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
SKILLS	Languages: Python, Go, C++, C, SQL, Rust, MATLAB, JavaScript, Verilog, SPICE Frameworks and packages: PyTorch, Keras, OpenCV, scikit-learn, Numerical Python Web Development: Node, Express, Postgresql Tools: git, Docker, bash/zsh, vim, Linux Hardware: Raspberry Pi, Arduino, Xilinx Artix 7	

NOTABLE
PROJECTS

- Fashion Discovery for Video Commerce** *Sep 2021 – Present*
- Working on designing and building the data and model pipelines to solve the “Exact street-to-shop” - cross-domain image-based image retrieval problem.
- Low-light image enhancement on low power devices** *Aug 2020 – May 2021*
- Worked on the design of hardware and software-optimized algorithms to capture vibrant and detailed low-light photos with inexpensive camera sensors.
 - Worked on model compression algorithms to fit memory and speed constraints.
 - Built tools for better testing, deployment and to prevent model regressions.
- Change detection in SAR images** *Feb 2021 – May 2021*
- Worked on developing a multi-sensor, multi-modal algorithm for change detection in bi-temporal Synthetic Aperture Radar (SAR) images.
- Multi-lingual speech enhancement** *Feb 2021 – May 2021*
- Worked on improving the quality and intelligibility of noisy speech recordings using deep neural networks that generalize over multiple out of sample languages.
- Information extraction from PDFs** *Apr 2021*
- Designed a system to detect tables and extract information embedded in the table cells, as a part of a system to automate the summarisation of insurance policies.
- Image Restoration** *Jul 2020*
- 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.
- Segmentation of brain tumours in MRI images** *Dec 2019*
- Reproduced state of the art semantic segmentation models in Keras/TFv1 to segment brain tumours and surrounding edema from MRI images
- Detecting Ponzi schemes in blockchain smart contracts** *Aug 2019 – Sep 2019*
- 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.
 - The model was trained 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.
- Predicting truth level of news articles** *Jul 2019 – Aug 2019*
- Built a model to classify news articles into 6 different categories based on their truth level.
 - The model was trained on the LIAR-PLUS dataset containing news articles and fact-checking justifications from trusted sources.
- Space Time Adaptive Processing Radar** *Apr 2019*
- Presented a report on the current state of STAP in Radar Signal Processing.
 - Simulated a radar implementing STAP in Matlab.

RELEVANT
COURSEWORK

Neural Networks & Deep learning, Applications of Machine Learning in Medical Imaging, Image and Video Processing, Speech and Audio Processing, Digital Signal Processing Statistical Analysis, Numerical Analysis
Embedded Systems, Digital System Design, Microprocessors, VLSI Design, Control Systems Data Structures & Algorithms, Digital Electronics & Computer Architecture

ACHIEVEMENTS

- 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”. *July 2020*
- Had to refuse offer due to conflicts with the university’s schedule for the 6th semester.
- Selected for a **funded research internship** at HEPIA-Hesge, Geneva, Switzerland *Mar 2020* to work on “NavTrack: A portable obstacle tracker for the rehabilitation of spatial neglect”
- Offer rescinded due to pandemic-induced travel restrictions & lockdowns.