



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	Computer Vision, Low Power Computing	
EDUCATION	National Institute of Technology Karnataka (NIT Karnataka) Bachelor of Technology, Electronics and Communications Engineering	8.58 Jul 2017 – May 2021
PUBLICATIONS	Lal, S., Dsouza, R. , Maneesh, M., Kanfode, A., Kumar, A., Perayil, G., Alabhya, K., Chanchal, A.K. and Kini, J. “A Robust Method for Nuclei Segmentation of H&E Stained Histopathology Images.” 2020, 7th International Conference on Signal Processing and Integrated Networks (SPIN) (pp. 453–458). IEEE. DOI: 10.1109/SPIN48934.2020.9070874	
RESEARCH EXPERIENCE	Research Intern, CSRE, IIT-Bombay Land-use classification from hyperspectral & LiDAR satellite imagery Advisor: Prof. Biplab Banerjee Jun 2021 – Present – Working on multi-modal land-use classification using vision transformers & CNNs. Winter Research Intern, Deep learning lab, NIT Karnataka Segmentation of nuclei in histopathology images of kidney, liver and bladder tissues Advisor: Dr. Shyam Lal Dec 2019 – Feb 2020 – 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 repository 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 Advisor: Dr. Shyam Lal May 2019 – Jun 2019 – 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.	
WORK EXPERIENCE	Frontend Developer and UI Designer IRIS, NIT Karnakata Aug 2018 – Apr 2019 – 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 May 2018 – Jun 2018 – 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.	

SKILLS	<p>Languages: Python, Go, C++, C, MATLAB, JavaScript, Verilog, SPICE</p> <p>Frameworks and packages: PyTorch, Keras, OpenCV, scikit-learn, Numerical Python</p> <p>Web Development: React, Express, Node, SQL</p> <p>Hardware: Raspberry Pi, Arduino, Xilinx Artix 7 FPGA</p>
NOTABLE PROJECTS	<p><i>Low-light image enhancement on low power devices</i> <i>Aug 2020 – May 2021</i></p> <ul style="list-style-type: none"> – Working on the design of hardware and software-optimized algorithms to capture vibrant and detailed low-light photos with inexpensive camera sensors. – Working on model compression algorithms to fit memory and speed constraints. – Building tools for better testing, deployment and to prevent model regressions. <p><i>Change detection in SAR images</i> <i>Feb 2021 – May 2021</i></p> <ul style="list-style-type: none"> – Working on developing a multi-sensor, multi-modal algorithm for change detection in bi-temporal Synthetic Aperture Radar (SAR) images. <p><i>Multi-lingual speech enhancement</i> <i>Feb 2021 – May 2021</i></p> <ul style="list-style-type: none"> – Working on improving the quality and intelligibility of noisy speech recordings using deep neural networks that generalize over multiple out of sample languages. <p><i>Information extraction from PDFs</i> <i>Apr 2021</i></p> <ul style="list-style-type: none"> – 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. <p><i>Image Restoration</i> <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><i>Muon Physics</i> <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><i>Segmentation of brain tumours in MRI images</i> <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 <p><i>Detecting Ponzi schemes in blockchain smart contracts</i> <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. – 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. <p><i>Predicting truth level of news articles</i> <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. – The model was trained on the LIAR-PLUS dataset containing news articles and fact-checking justifications from trusted sources.
RELEVANT COURSEWORK	<p>Neural Networks & Deep learning, Application of Machine Learning in Medical Imaging, Image and Video Processing, Speech and Audio Processing, Digital Signal Processing</p> <p>Statistical Analysis, Numerical Analysis</p> <p>Embedded Systems, Digital System Design, Microprocessors, VLSI Design, Control Systems</p> <p>Data Structures & Algorithms, Digital Electronics & Computer Architecture</p>
MISCELLANEOUS	<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> <p>Selected for a research internship at HEPIA-Hesge, Geneva, Switzerland <i>Mar 2020</i> to work on "NavTrack: A portable obstacle tracker for the rehabilitation of spatial neglect"</p> <ul style="list-style-type: none"> – Received a grant of 4200CHF to conduct research under Prof. Florent Gluck, HEPIA.