



# Russel Shawn Dsouza

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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, Mixed Reality	
EDUCATION	<b>National Institute of Technology Karnataka (NIT Karnataka)</b> Bachelor of Technology, Electronics and Communications Engineering	Jul 2017 – May 2021
PUBLICATIONS	Lal, S., <b>Dsouza, R.</b> , 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	<b>Winter Research Intern, Deep learning lab, NIT Karnataka</b> <b>Segmentation of nuclei in histopathology images of kidney, liver and bladder tissues</b> Mentored by Dr. Shyam Lal Dec 2019 – Feb 2020 <ul style="list-style-type: none"><li>– Implemented state of the art models and designed data pipelines for nuclear segmentation in histopathology images of kidney and liver tissues.</li><li>– Worked on the detection of Urothelial Carcinoma from whole slide images (average dimensions of 80000×50000) of bladder tissues.</li><li>– Built an open-source repository 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, Deep learning lab, NIT Karnataka</b> Mentored by Dr. Shyam Lal May 2019 – Jun 2019 <ul style="list-style-type: none"><li>– Designed and debugged efficient implementations of classical image processing algorithms on large datasets.</li><li>– Developed and maintained data pipelines for deep learning based image segmentation and classification models.</li><li>– Worked on reproducing results from seminal papers in the field of automated histopathology.</li></ul>	
WORK EXPERIENCE	<b>Frontend Developer and UI Designer</b> <b>IRIS, NIT Karnakata</b> Aug 2018 – Apr 2019 <ul style="list-style-type: none"><li>– Debugged and maintained parts of the frontend code at IRIS — The official student portal of NIT Karnataka.</li><li>– Designed a new UI system from the ground up in Figma.</li><li>– Developed the design system in Vue and worked on an integration with the legacy Rails code.</li></ul> <b>Python Developer</b> <b>Pinnacle Media, Manipal</b> May 2018 – Jun 2018 <ul style="list-style-type: none"><li>– 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.</li></ul>	
SKILLS	<b>Languages:</b> Python, C++, MATLAB, Javascript, C, Verilog, ngSPICE <b>Frameworks and packages:</b> PyTorch, Keras, OpenCV, scikit-learn, Numerical Python <b>Web Development:</b> React, Express, Node, MongoDB, GraphQL <b>Tools:</b> git, bash, Docker, TravisCI, Linux, vim, PyCharm <b>Hardware:</b> Raspberry Pi, Arduino, Xilinx Artix 7 FPGA <b>Natural languages:</b> English, Hindi, Kannada	

NOTABLE  
PROJECTS

- Low-light image enhancement on low power devices*** *Aug 2020 – Present*  
 – Working on the design of hardware and software-optimized algorithms to enable people to capture vibrant and detailed low-light photos with inexpensive camera sensors.
- Satellite detection in images from low-cost telescopes*** *Jul 2020 – Present*  
 – Working on the design and development of a model to detect orbiting objects in the geostationary ring, from sequences of consecutive frames imaging unknown portions of the sky, as a part of the ‘spotGEO’ competition by the European Space Agency (ESA).
- Image Denoising*** *Jul 2020*  
 – Reproduced a very deep persistent memory network to perform image restoration by removing noise and predicting uncorrupted images and achieved results comparable to the original paper.  
 – The model was trained on images from the Berkeley Segmentation Dataset (BSDS300) and tested on a modified version of the CIFAR10 dataset.
- Muon Physics*** *Mar 2020 - Jun 2020*  
 – Designed a custom model to classify muon momenta using a tabular dataset of variables and parameters.  
 – The model was trained on monte-carlo simulated data from the Cathode Strip Chambers (CSC) at the CMS experiment of Large Hadron Collider at CERN.
- 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.  
 – The model was trained and tested on a part of the Brain Tumour Segmentation (BraTS) dataset.
- 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.  
 – 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.  
 – Developed in under 48h as a part of a coding sprint.
- 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, Application of Machine Learning in Medical Imaging, Digital Signal Processing, Digital System Design  
 Statistical Analysis, Numerical Analysis  
 Embedded System Design, Microprocessors, VLSI Design, Control Systems  
 Data Structures & Algorithms, Digital Electronics & Computer Architecture

ACHIEVEMENTS

- Selected as a **full-time research intern** at the ML Lab, RBCCPS, IISc, Bangalore *Jul 2020*  
 to work on “Simultaneous localization and mapping (SLAM)”  
 – Rescinded due to schedule conflicts (primarily because of COVID-19).
- Selected for a **research internship** at HEPIA-Hesge, Geneva, Switzerland *Mar 2020*  
 to work on “NavTrack: A portable obstacle tracker for the rehabilitation of spatial neglect”  
 – Received a grant of 4200CHF to conduct research under Prof. Florent Gluck, HEPIA.  
 – Rescinded (Internship & grant) due to COVID-19.