Russel Shawn Dsouza

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CONTACT INFORMATION

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RESEARCH INTERESTS

Computer Vision, Low Power Computing

EDUCATION

National Institute of Technology Karnataka (NIT Karnataka)
Bachelor of Technology, Electronics and Communications Engineering *Jul 2017 – May 2021*

PUBLICATIONS

Lal, S., **Dsouza, R.**, Maneesh, M., Kanfade, 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

Winter Research Intern, Deep learning lab, NIT Karnataka
Segmentation of nuclei in histopathology images of kidney, liver and bladder tissues
Mentored by 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
Mentored by 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

Languages: Python, C++, Go, MATLAB, Javascript, C, Verilog, SPICE
Frameworks and packages: PyTorch, Keras, OpenCV, scikit-learn, Numerical Python
Web Development: React, Express, Node
Tools: git, bash, Docker, Linux, vim, PyCharm
Hardware: Raspberry Pi, Arduino, Xilinx Artix 7 FPGA

NOTABLE PROJECTS	**_Low-light image enhancement on low power devices_** _Aug 2020 – Present_
	– 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.
	– Incorporating inference optimization methods for high performance deployments.
	– Building tools for better testing, deployment and to prevent model regressions.

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.

Muon Physics _Mar 2020 - Jun 2020_

– Designed a custom model to classify muon momenta which 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

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, 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 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 lockdowns caused by the COVID-19 pandemic.