




# Russel Shawn Dsouza

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## Skills

### Programming languages

Python, MATLAB, C, Rust, JavaScript, C++, Verilog

### Deep learning

PyTorch, Keras, torchvision, scikit-learn

### Image processing

OpenCV, scikit-image, PIL

### Data mining & analysis

Google BigQuery, SQL, requests, pandas

### Web development

Django, ExpressJS, ReactJS, GatsbyJS, GraphQL

### Hardware

Xilinx Artix 7 FPGA, Raspberry Pi, Arduino

### Tools

git, Docker, Linux, Xilinx Vivado, L<sup>A</sup>T<sub>E</sub>X

## Notable Projects

### Computational histopathology

Dec 2020 - Present

Working on building a benchmark repository of state-of-the-art architectures and methods for segmentation and classification of nuclei in histopathology images.

### Cell nuclei segmentation

May 2019 - July 2019

Implemented convolutional encoder-decoder architectures including U-Net, UNet with pyramid pooling and ResNets in PyTorch to perform the semantic segmentation of nuclei in H&E stained histopathology images of kidney tissues.

### Brain tumour segmentation

Dec 2019

Implemented state-of-the-art semantic segmentation models in Keras and trained them on a part of the BRATS dataset to segment brain tumour and surrounding edema as a part of a 14-day workshop on Machine learning techniques in Neuroimaging.

### Classifying components of handwritten Bengali

Jan 2020 - Present

Working on the Kaggle Bengali.AI Grapheme classification challenge using efficient models that train on single GPU systems.

### Detecting Ponzi schemes in Ethereum smart-contracts

Aug 2019 - Sep 2019

Built a custom model using CNNs and Stacked Autoencoders in PyTorch and torchtext, and trained it on raw bytecode of Ethereum smart contracts mined using Google BigQuery to detect Ponzi schemes in Ethereum smart-contracts as a part of a 48-hour sprint to apply deep-learning on the blockchain.

### Predicting truth level of news articles

Jul 2019 - Aug 2019

Built a classifier using a Bidirectional-LSTM in PyTorch and torchtext, and trained it on the LIAR-PLUS dataset to classify news articles into 6 different categories based on their truth-level.

### Spell checker

Oct 2018 - Nov 2018

Built a command line application to correct spelling errors in C as a part of a course-project in Data Structures & Algorithms.

### Space-time adaptive processing radar

Apr 2019 - May 2019

Presented a report on space-time adaptive processing and simulated STAP in a radar in MATLAB as a part of a mini-project on Digital Signal Processing.

## Experience

### Winter Research Intern

Dec 2019 - Present

Under Dr. Shyam Lal - NITK, India

Working on the design and development of an automated kidney & colon cancer detection system from H&E stained histopathology images.

### Summer Research Intern

May 2019 - Jul 2019

Under Dr. Shyam Lal - NITK, India

Worked on reproducing state-of-the-art deep learning architectures for the semantic segmentation of H&E stained histopathology images of kidney tissues.

### Frontend Engineer

Aug 2018 - Apr 2019

IRIS-NITK, India

Worked on building the frontend for the official student management portal 'IRIS' with more than five thousand daily active users including students, faculty, administrators and alumni.

Mentored a freshman intern on frontend testing.

### Python Developer

May 2018 - July 2018

Pinnacle Media, Manipal, India

Worked on implementing real time face detection and recognition using open-cv, dlib and scikit-learn on a Raspberry Pi.

## Education

National Institute of Technology Karnataka, India

2017-2021(expected)

B.Tech in Electronics and Communications Engineering

CGPA: 8.7

Little Rock Indian School, Karnataka, India

2004-2017

K-12

## Course Work

Digital signal processing in Python, Machine learning in neuroimaging,  
Digital system design in Verilog, Embedded system design, Microprocessors, Control systems,  
Numerical Analysis, Statistical Analysis, Data structures and algorithms,  
Digital & Analog communication, Analog electronics, Digital electronics & Computer architecture

## Awards and Honors

School topper in Math(99/100) and English(98/100) in Grade 12

Top 1%(CGPA 10.0) in India in Grade 10

## Interests

Medical imaging, computer vision, computational neuroscience and augmented reality