

# Russel Shawn Dsouza

3rd year, Electronics & Communications Engineering  
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## Skills

### Research areas

Deep learning for computer vision  
Low power computer vision  
Medical image processing - Histopathology, MRI, CT

### Programming languages

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

### Deep learning

PyTorch, Keras, 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 Vivado and Artix 7 fpga, ngSPICE, Raspberry Pi, Arduino

### Tools

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

## Notable Projects

### Detection of Urothelial Carcinoma from whole-slide images

Feb 2020 - Present

Working on the design and development of an efficient automated algorithm for the visual and semantically interpretable detection of Urothelial Carcinoma from whole slide images with an average dimension of 80,000 x 50,000

Technologies used: `rshwndsz/histovision`

### Computational histopathology

Dec 2019 - Present

Working on `rshwndsz/histovision`, a benchmark repository of state-of-the-art architectures and methods for segmentation and classification of nuclei in histopathology images.

PyTorch, OpenCV, Nvidia-Dali

### Cell nuclei segmentation

May 2019 - July 2019

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

PyTorch, OpenCV

### Brain tumour segmentation

Dec 2019

Coded state-of-the-art semantic segmentation models 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.

Keras, OpenCV

### Classifying components of handwritten Bengali

Jan 2020 - Present

Working on efficient, flexible models with low training times on single GPU systems for the Kaggle Bengali.AI Grapheme classification challenge.

PyTorch, Nvidia-Dali

**Detecting Ponzi schemes in Ethereum smart-contracts**

Aug 2019 - Sep 2019

Built a custom model using CNNs and stacked autoencoders and trained it on raw bytecode of Ethereum smart contracts mined from the blockchain to detect Ponzi schemes in Ethereum smart-contracts as a part of a 48-hour sprint to "apply deep learning on any part of the blockchain".

PyTorch, torchtext, SQL, Google BigQuery, pandas

**Predicting truth level of news articles**

Jul 2019 - Aug 2019

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

PyTorch, torchtext

**Spell checker**

Oct 2018 - Nov 2018

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

C, make

**Space-time adaptive processing radar**

Apr 2019 - May 2019

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

MATLAB, L<sup>A</sup>T<sub>E</sub>X

## Experience

**Winter Research Intern**

Dec 2019 - Jan 2020

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.

**Part-time 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.

## Publications

1. Shyam Lal, Anirudh Kanfode, Kumar Alabhya, **Russel Dsouza**, Aman Kumar, Maneesh M, Gokul Perayil, Jyoti Kini  
**A Robust Method for Nuclei Segmentation of H&E Stained Histopathology Images**  
 IEEE 7th International Conference on Signal Processing and Integrated Networks (SPIN 2020), 27 - 28 February 2020, Amity University, Sec-125, Noida, Delhi-NCR, India – *Accepted*
2. Shyam Lal, **Russel Dsouza**, Anirudh Kanfode, Kumar Alabhya, Aman Kumar, Maneesh M, Jyoti Kini  
**Deep Learning based Framework for Segmentation of H&E Stained Histopathology Images of Kidney Tissues**  
 IEEE Transactions of Medical Imaging, IEEE publisher. Indexed by SCI, Thomson ISI, Scopus (Elsevier), JCR (2018) Impact Factor: 2.770. – *Under preparation*

## 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, VLSI design  
 Numerical Analysis, Statistical Analysis, Data structures and algorithms, 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

Computer vision, Neuroscience and Augmented Reality

Last updated: February 28, 2020

<https://github.com/rshwndsz/resume/blob/master/CV.pdf>