# Kevin Raj

*Research Assistant, Spectrum Lab, IISc.*

✉ *kevinyitshak@gmail.com*
*kevinyitshak.github.io/*

## Education

2015–2019 **Manipal Institute of Technology.**
*B.Tech. in Electrical and Electronics Engineering (EEE)*
*Specialization*: Signal Processing & Control.
*Thesis*: Optic Disc Segmentation Using Modified DRIU. [pdf]
*Supervisors*: Dr. Chandra Sekhar Seelamantula and Prof. Harish Kumar J.R.

## Interests

Image Processing, Signal Processing, Computer Vision, Machine Learning, Linear Algebra.

## Research Experience

Aug'19 - Present **Research Assistant,** *Spectrum Lab, Indian Institute of Science.*
*Supervisor*: Dr. Chandra Sekhar Seelamantula.
*Objective:* Working on classifying nine different abnormalities captured from Wireless Capsule Endoscopic procedure (WCE) using neural architecture search technique. This work is in collaboration with Indian Air-Force Command Hospital, Bangalore. *Tool used:* Python, Pytorch, OpenCV.

Jan'19 - June'19 **Research Intern,** *Spectrum Lab, Indian Institute of Science.*
*Supervisor*: Dr. Chandra Sekhar Seelamantula.
*Objective:* Proposed an Artery - Vein classification network from single-wavelength fundus images using the low-level to high-level features extracted from Identity mapping network, which acts as a backbone architecture. I also developed an ImageJ plugin and android application based on the 'ICIP 2019' paper. *Tool used:* Python, Keras, OpenCV, ImageJ, Java.

May'18- July'18 **Summer Research Intern,** *Spectrum Lab, Indian Institute of Science.*
*Supervisor*: Dr. Chandra Sekhar Seelamantula.
*Objective*: Proposed a novel methodology using a multi-scale Harris corner technique and iterative Voronoi decomposition technique for optic cup segmentation using the structural properties of blood vessels. The Ministry of Human Resource Development **(MHRD)**, India, under the **IMPRINT** initiative, funded this project. *Tool used:* MATLAB.

## Conference Proceedings

2020 **P. Kevin Raj**, Aniketh Manjunath, J.R.H. Kumar and Chandra S. Seelamantula. "Automatic Classification of Artery-Vein from a Single Wavelength Fundus Images", In *Proc. IEEE International Symposium on Biomedical Imaging (ISBI)*, Iowa, USA, 2020.

2019 **P. Kevin Raj**, J.R.H Kumar, S. Jois, S. Harsha and Chandra S. Seelamantula. "A Structure Tensor based Voronoi Decomposition Technique for Optic Cup Segmentation" , In *Proc. IEEE International Conference on Image Processing (ICIP)*, Taipei, Taiwan, 2019.
[pdf] [Oral]

2019 J.R.H. Kumar, K. Teotia, **P. Kevin Raj**, A. Jasbon, K.V. Rajagopal and Chandra S. Seelamantula. "Automatic Segmentation of Common Carotid Artery in Longitudinal Mode Ultrasound Images Using Active Oblongs", In *Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Brighton, UK, 2019.
[pdf]

## Projects

*Supervisor*: Prof. Harish Kumar J. R.
*Objective:* Developed a method for automatic segmentation of Hard Exudates (yellow lesions) in Fundus images using Principal Component Analysis and multi-level Otsu thresholding, which acts as a basis to assess the severity of disease known as Diabetic Retinopathy. *Tool used:* MATLAB.

*Supervisor*: Prof. Chandra S. Seelamantula.
*Objective:* Implemented a state-of-the-art paper titled 'Deep Retinal Image Understanding' for the segmentation of Optic Disc and Blood Vessels in fundus images. *Tool used:* Python, Keras.

## Awards

2019 **Travel Grant**: Amount of 940 USD awarded by IEEE Singal Processing Society to attend ICIP 2019.

## Professional Skills

- **Computer Skills:**

Python, MATLAB, LaTeX, OpenCV, tensorflow, keras, pytorch

- **Certifications:**

Image and Video Processing, by Duke **Coursera**, Digital and Signal Processing, by EPFL **Coursera**, Neural Networks and Deep Learning, Machine Learning, and Hyperparameter tuning, Regularization and Optimization, by Deeplearning.ai **Coursera**.

- **Coursework:**

Linear Algebra, Advanced Digital Signal Processing, Application of Digital Signal Processing, Machine Learning.