Balamurali
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Education

- **College Of Engineering, Guindy** — Chennai,India
  Bachelor of Engineering in Biomedical Engineering; CGPA:(8.01/10.0) — *Aug. 2010 – July. 2014*
- **Indian Institute of Technology Madras** — Chennai,India
  Master of Science in Electrical Engineering; CGPA:(8/10.0) — *Aug. 2018 – Present*

Experience

- **Healthcare Technology Innovation Centre** — Chennai,India
  Project associate — *June 2016 - Present*
  - **Annotation tools**: With the advent of deep learning, the major bottleneck is dataset. Annotation tools were created for high-resolution nissl stain and histopathology images to develop datasets.
  - **Processing high resolution images**: To process images of higher resolution in efficient manner, an application is developed which receives the image and deploys it in univa grid engine.
  - **Challenge hosting**: Nissl section segmentation challenge is hosted in Medical Image Computing and Computer Assisted Intervention(MICCAI).
  - **Automatic Polyp detection in Colonoscopy videos**: Polyp detection helps increase the attentiveness of colonoscopists. Convolutional neural networks are developed to classify whether the image has polyp or not and to localize the polyp in the given image.
- **Computational Neuroscience Lab, Indian Institute of Technology Madras** — Chennai,India
  Project associate — *Jun 2015 - Apr 2016*
  - **Telugu handwritten recognition**: Developed a telugu handwritten recognition system in collaboration with Centre for Development of Advanced Computing.
  - **Bharati- Common script for India**: Bharati is being proposed as a common script for all the regional languages to avoid communication barrier.Font design and character recognition software are built.
- **Assistive Technology lab, Indian Institute of Technology Madras** — Chennai,India
  Project associate — *Nov 2014 - Apr 2015*
  - **iGest**: iGest is a device made to help physiotherapist track their patient activities.Built the complete system end-to-end.

Publications

1. Murugesan, B., Sarveswaran, K., Shankaranarayana, S.M., Ram, K., Joseph, J. and Sivaprakasam, M., 2019. Conv-MCD: A Plug-and-Play Multi-task Module for Medical Image Segmentation. arXiv preprint arXiv:1908.05311.

2. Murugesan, B., Sarveswaran, K., Shankaranarayana, S.M., Ram, K. and Sivaprakasam, M., 2019. Psi-Net: Shape and boundary aware joint multi-task deep network for medical image segmentation. arXiv preprint arXiv:1902.04099.

3. Ravichandran, V., Murugesan, B., Balakarthikeyan, V., Shankaranarayana, S.M., Ram, K., Joseph, J. and Sivaprakasam, M., 2019. RespNet: A deep learning model for extraction of respiration from photoplethysmogram. arXiv preprint arXiv:1902.04236.

4. Ravichandran, V., Murugesan, B., Shankaranarayana, S.M., Ram, K., Preejith, S.P., Joseph, J. and Sivaprakasam, M., 2019, June. Deep Network for Capacitive ECG Denoising. In 2019 IEEE International Symposium on Medical Measurements and Applications (MeMeA) (pp. 1-6). IEEE.

5. Murugesan, B., Ravichandran, V., Ram, K., Preejith, S.P., Joseph, J., Shankaranarayana, S.M. and Sivaprakasam, M., 2018, June. ECGNet: Deep Network for Arrhythmia Classification. In 2018 IEEE International Symposium on Medical Measurements and Applications (MeMeA) (pp. 1-6). IEEE.

6. Murugesan, B., Selvaraj, S., Sarveswaran, K., Ram, K., Joseph, J. and Sivaprakasam, M., 2019, March. Deep detection and classification of mitotic figures. In Medical Imaging 2019: Digital Pathology (Vol. 10956, p. 109560T). International Society for Optics and Photonics.

7. Deep Learning based Retinal Image Analysis for evaluation of Glaucoma

8. Design and Development of an Assistive Device for Speech Impaired

Projects

- **Software for Optical mark reader**: In collaboration with Hashbytes Technology Solutions, a complete software is developed. The tool has been used by the government of Tamil Nadu and Karnataka to process 3.5 million sheets till now.
- **Platform for joint optic disc, and cup segmentation for analysis of Glaucoma**: Cup-to-disc ratio is used for Glaucoma screening. A deep neural network is developed which takes in a fundus image and assigns pixel-wise labels for cup, disc and background.
- **Predictive modeling of Remaining Useful Life**: A tool is developed to predict Remaining Useful Life for Turbofan Engine Degradation dataset by NASA.This helps optimize the periodic maintenance operations.
- **Classify product images in supermarket**: Hackerearth hosted a challenge in collaboration with largest retailer in Germany asking for best classifier. Powerful deep networks like DenseNet and ResNet are used as ensemble to give us a place in top 5%.
- **Face recognition – A tool to verify a person**: Lynk, a company helping to connect customer with truck driver hosted a hackathon asking participants to come up with a face verification tool. The network developed is provided as an API to the company in the end.The network developed was robust to common computer vision problems.

Programming Skills

- **Languages**: Python,Matlab,Javascript, C++, SQL.
- **Modules**: Pytorch,Scikit-learn,OpenCV,Django,OpenLayers.