

Abhijeet Dhupia

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EDUCATION

Manipal Institute of Technology

B.Tech. in Electrical and Electronics Engineering (EEE)

Specialisation: Data Science

Thesis: Automatic Segmentation of Lumen Intima Layer in Ultrasound Images

Supervisor: Prof. Harish Kumar J.R.

Manipal, India

July 2015 – June 2019

[Thesis]

RESEARCH EXPERIENCE

Spectrum Lab, Indian Institute of Science

Research Assistant

Supervisor: Dr. Chandra Sekhar Seelamantula

Bangalore, India

August 2019 - Present

- **Bill & Melinda Gates Foundation Project**

Applying Few-Shot Learning models to segment gastrointestinal disorders and abnormalities in the wireless capsule endoscopy images. This work is in collaboration with the Indian Air-Force Command Hospital, Bangalore. Additionally, developing and maintaining UI interface from front to back end for COVID-19, Wireless Capsule Endoscopy, and Ophthalmology healthcare projects.

- **QpiAI Project**

Worked on a collaborative project with QpiAI to develop a cloud-based AI Healthcare platform.

- **IMPRINT Project**

Implemented neural architecture search based techniques like DARTS and NAS-Unet to segment Optic Disc of a fundus image.

QpiAI (in collaboration with IISc)

Research Intern

Supervisor: Dr. Chandra Sekhar Seelamantula

Bangalore, India

April 2020 - September 2020

- **End to End Video Analytics Platform for Healthcare**

Designed and developed the pipeline for an end to end cloud-based AI platform to analyze the trails generated by wireless capsule endoscope.

[Platform]

Manipal Institute of Technology

Research Assistant

Supervisor: Prof. Harish Kumar J.R.

Manipal, India

August 2019 - Present

- **Automatic Segmentation of Lumen Intima Layer in Ultrasound Images**

Proposed a fully automated method for the segmentation of the lumen intima layer of the common carotid artery in longitudinal mode ultrasound images.

[EMBC Paper]

PUBLICATIONS

- [1] **A. Dhupia**, J. R. Harish Kumar, J. Andrade, and K. V. Rajagopal, “Automatic segmentation of lumen intima layer in longitudinal mode ultrasound images”, in *2020 42nd Annual International Conference of the IEEE Engineering in Medicine Biology Society (EMBC)*, 2020, pp. 2125–2128.

PROJECTS

- **Few-Shot Learning Segmentation** | *Python, Pytorch, OpenCV*
Working on an end-to-end Bayesian learning framework for few-shot learning, which utilizes the information from both the support and query images. The final segmentation mask is predicted using the multivariate Gaussian Mixture Model and a shallow convolution neural network.
- **AI Diagnostic Platform for Wireless Capsule Endoscopy** | *Python, Pytorch, OpenCV* [\[Git\]](#)
Worked on a one-stop end to end platform to analyze the trails generated by a wireless capsule endoscope (WCE); a typical WCE procedure generates about 50 to 100K images. The endoscope frames are first classified as abnormal vs normal, followed by hierarchical tree classification. Subsequently, the abnormal frames are segmented, selecting about 50 clinically relevant representative images per patient.
- **AI Healthcare Diagnostic Platform** | *JavaScript, HTML5, CSS* [\[Git\]](#) [\[Webpage\]](#)
Developing and handling the AI diagnostic platform from front to back end for COVID-19, Wireless Capsule Endoscopy, and Ophthalmology.
- **Wireless Capsule Endoscopy Classification** | *Python, Pytorch, OpenCV* [\[Git\]](#)
Implemented ResNet and Vision Transformers models to classify anomalies present in the gastrointestinal tract. The experiments are validated on the publicly available KID datasets.
- **Lumen Intima Layer Segmentation** | *ImageJ, MATLAB* [\[EMBC Video\]](#)
Proposed a fully automated method to segment the lumen intima layer of the common carotid artery in longitudinal mode ultrasound images. First, a coarse segmentation is achieved by optimizing a locally defined contrast function of an active oblong followed by post-processing the optimally fitted oblong's annulus region using various image processing techniques. Upon validation, the proposed method achieved a Dice coefficient of 95.23% and an accuracy of 98.90%.

ACCOMPLISHMENTS

- Qualified Graduate Aptitude Test in Engineering (GATE 2021) — 87.2 percentile.
- Completed hands-on training in Fundamentals of Deep Learning at NVIDIA GTC 2021. [\[Certificate\]](#)
- Completed Deep Learning Specialization offered by DeepLearning.AI. [\[Certificate\]](#)
- Completed Data Science Specilization offered by Johns Hopkins University. [\[Certificate\]](#)
- Certified Microsoft Technology Associate for Software Development Fundamentals. [\[Certificate\]](#)

SKILLS

- **Languages:** Python, C++, CSS, HTML5, ImageJ, L^AT_EX, MATLAB, Markdown, R, Shell Scripting, Vim.
- **Software/Frameworks:** Pytorch, TensorFlow, AWS, Docker, Flask, Git, Jira, OpenCV.

VOLUNTEERING

- Assisted in reviewing IEEE ICIP 2020 and 2021 conference papers.
- Volunteered at the Neural Information Processing Systems. [\[NeurIPS 2020\]](#)
- Volunteered at the International Conference on Machine Learning. [\[ICML 2020\]](#)
- Organized the Glacouma screening booth representing the Spectrum Lab at IISc Open Day 2020.