Varun Belagali

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Education

Bachelor of Engineering, Computer Science and Engineering **Aug 2016 — Aug 2020**
R V College of Engineering, Bangalore, GPA: 9.22/10

Experience

Research Associate **Aug 2021 — Present**
Spire Lab, Indian Institute of Science Bangalore

- Working on Machine Learning and Computer Vision - Video/image segmentation, Generation of lip synced video from audio
- Advisor - Dr. Prasanta Kumar Ghosh

Software Engineer 1 **July 2020 — Sept 2021**
Citrix R&D Bangalore

- Developed Citrix Cloud and Identity Platforms (https://docs.citrix.com/en-us/citrix-cloud.html)

Visiting Research Intern **Jun 2018 — May 2020**
Spire Lab, Indian Institute of Science Bangalore

- Worked on automatic glottis localization and segmentation in stroboscopic videos (https://spire.ee.iisc.ac.in/spire/glottis.php)
- Advisor - Dr. Prasanta Kumar Ghosh

Software Engineer Intern **Jan 2020 — Jun 2020**
Citrix R&D Bangalore

- Worked on Azure Key Vault and Citrix Cloud services

Student trainee **Aug 2019 — Jan 2020**
Samsung Prism Program, Samsung R&D Institute Bangalore

- Worked on voice call spam detection
- Advisor - Dr. Rajashree Shettar

Research Papers

1. **Varun Belagali**, Achuth Rao M V, Pebbili Gopikishore, Rahul Krishnamurthy, Prasanta Kumar Ghosh, "Two step convolutional neural network for automatic glottis localization and segmentation in stroboscopic videos", published in Biomedical Optics Express 11.8 (2020): 4695-4713. https://doi.org/10.1364/BOE.396252 [Journal paper]

2. Anwesha Roy, **Varun Belagali**, Prasanta Kumar Ghosh, "An error correction scheme for improved air-tissue boundary in real-time MRI video for speech production", under review at ICASSP 2022. [Conference paper]

3. Abhiram Natarajan, Anirudh Kannan, **Varun Belagali**, Vaibhavi N Pai, Rajashree Shettar, Poonam Ghuli, "Spam Detection over Call Transcript using Deep Learning", accepted at Future Technologies Conference (FTC) 2021. [Conference paper]

Projects

Automatic glottis localization and segmentation in stroboscopic videos **Ongoing**

- Project aims to quantify the minimal glottal opening area from stroboscopic video recording of patients suffering with voice disorders to assist Speech Language Pathologists in tracking the voice therapy
- Proposed a two step CNN model that outperformed the baseline by 24.64% in terms of localization accuracy and by 0.26 in terms of dice score. The model was trained using supervised methods. Work published in Biomedical Optics Express 2020
- Currently working on image segmentation with limited labels - weakly supervised learning using bounding box labels and multiple instance learning

Air tissue boundary segmentation in MRI videos **Ongoing**

- Carried out analysis on robustness of SegNet and 3D-CNN models. Proposed new evaluation metrics, an error detection and correction scheme for improved air-tissue boundary in real-time MRI video. Paper under review at ICASSP 2022

Lip synced video synthesis from audio **Ongoing**

- Working on real and animated lip synced video generation from audio for nine Indian languages.
- This project is part of SYSPIN initiative which aims to collect speech and text data for nine Indian langauges to bring voice AI to marginalised populations in India (https://syspin.iisc.ac.in)

Answer by Bixby - Spam Detection **Completed**

- Used combination of CNN and LSTM models to detect spam calls received by Samsung Voice Assistant Bixby
- Earned Certificate of Excellence for the contributions. Paper accepted at FTC 2021 conference.

SKILLS

Languages C, Python, Java, Matlab, C#
ML libraries Keras, Tensorflow, OpenCV, Scikit learn
Technologies Azure, Jenkins, Splunk, NewRelic

Course Work

Discrete Mathematics, Graph and Probability Theory , Complier Design, Artificial Neural Networks, Computer Vision, Advanced Linear Algebra, Data Science and Machine Learning Essentials. [Transcript-link]

Interests

Machine Learning, Deep learning, Computer Vision

Awards

2020 Certificate of Excellence - Samsung Prism Program [link]
2016 Dr. A. P. J Abdul Kalam Award for Excellence in Science

Online Courses

- Machine Learning, Coursera [link]
- Deep Learning Specialization (5 courses) - Deeplearning.ai ,Coursera [link]

Test Scores

- GRE - 326/340 (Quant - 169/170, Verbal - 157/170, AWA - 4/6)
- TOEFL - 103/120