Varun Belagali

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https://varunbelagali98.github.io

Education

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

Experience

Research Associate **Sept 2021 — Present**
Spire Lab, Indian Institute of Science Bengaluru

- Working on Video/Image segmentation and Generation of lip-synced video from audio
- Advisor - Dr. Prasanta Kumar Ghosh

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

- Developed C# applications to enhance Citrix cloud resiliency. Implemented cloud infrastructure optimization on Azure

Software Engineer Intern **Jan 2020 — June 2020**
Citrix R&D Bengaluru

- Integrated Azure key vault to Citrix cloud services to improve the security of secret management

Research Intern **June 2018 — May 2020**
Spire Lab, Indian Institute of Science Bengaluru

- Proposed two step CNN for automatic glottis localization and segmentation in stroboscopic videos (https://spire.ee.iisc.ac.in/spire/glottis.php)
- Advisor - Dr. Prasanta Kumar Ghosh

Research Intern **Aug 2019 — Jan 2020**
Samsung Prism Program, Samsung R&D Institute Bengaluru

- Worked on voice call spam detection using CNN and LSTM models
- 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. 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. https://link.springer.com/chapter/10.1007%2F978-3-030-89880-9_10 [Conference paper]

3. Anwesha Roy, **Varun Belagali**, Prasanta Kumar Ghosh, "An error correction scheme for improved air-tissue boundary in real-time MRI video for speech production", accepted at ICASSP 2022. https://arxiv.org/pdf/2203.06004. [Conference paper]

4. Anwesha Roy, **Varun Belagali**, Prasanta Kumar Ghosh, "Air tissue boundary segmentation using regional loss in real-time Magnetic Resonance Imaging video for speech production", accepted at INTERSPEECH 2022. https://varunbelagali98.github.io/publications/INTERSPEECH_2022.pdf [Conference paper]

Projects

Automatic glottis segmentation in stroboscopic videos **Ongoing**

- The project aims to quantify the minimal glottal opening area in the stroboscopic video recording of patients suffering from voice disorders. The changes in the glottal area can assist Speech-Language Pathologists in voice therapy tracking
- 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 the 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 accepted at ICASSP 2022
- Proposed regional loss functions to make networks more robust in predicting segmentation in error prone regions. Paper accepted at INTERSPEECH 2022

Lip-synced video synthesis from audio **Ongoing**

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

Citrix cloud resiliency enhancement and infrastructure optimization **Completed**

- Developed automatic geo failover application using C# to manage traffic during regional cloud outages
- Implemented azure node rebooting automation using C# to resolve high CPU and memory consumption issues
- Designed and implemented an efficient scale down of Azure resources used by Citrix Identity platform to reduce cloud cost

Answer by Bixby - Spam Detection **Completed**

- Used a 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, PyTorch, 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]

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]

Links

LinkedIn - https://www.linkedin.com/in/varun-belagali-17678218b/
Google Scholar - https://scholar.google.com/citations?user=tqEHnLUAAAAJ&hl=en
Spire Lab - https://spire.ee.iisc.ac.in/spire