

# Shubham Innani

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## Education

- 2016–2020 **Bachelor of Technology**, Department of Electronics and Telecommunication Engineering, Shri Guru Gobind Singhji Institute of Engineering and Technology, Nanded, Maharashtra - India.
- 2014–2016 **Higher Secondary Certificate**, S.S.D. Junior College, Hingoli, Maharashtra - India.
- 2001–2014 **Secondary School Certificate**, Mount Carmel High School, Washim, Maharashtra - India.

## Experience

- August 2022 - Present **Visiting Associate**, Center for Biomedical Image Computing and Analytics (CBICA), University of Pennsylvania, Philadelphia, United States of America.
- January 2021- July 2022 **Assistant System Engineer**, Tata Consultancy Services, Pune, India.
- March 2020- June 2020 **Data Science Intern**, Nymo.ai, Bangalore, India.

## Awards and Accomplishment

- 2020 **2<sup>nd</sup> Prize** in Semantic Segmentation Challenge on IDD dataset organized at Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP) at IIT Jodhpur, by IIIT Hyderabad, and Intel, India.
- 2020 Participated in Retinal Fundus Glaucoma Challenge Edition2 (REFUGE2) challenge at MICCAI, ranked in top 10.
- 2020 Participated in Age Related Macular Degeneration(AMD) challenge at IEEE International Symposium on Biomedical Imaging (ISBI) and ranked in top 10.
- 2020 Participated in Agriculture Vision Prize Challenge at Computer Vision and Pattern Recognition (CVPR).
- 2020 Poster Presentation at IEEE Conference on Computer Vision and Pattern Recognition (CVPR) in Agriculture Vision Workshop,.
- 2019 **1<sup>st</sup> Prize** in Semantic Segmentation Challenge on IDD lite dataset organized at National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics (NCVPRIPG), India, by IIIT Hyderabad, India and Intel, India.
- 2019 Travel Grant awarded to attend National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics (NCVPRIPG).

- 2019 Participated in AutoNUE Workshop Challenge organized at International Conference on Computer Vision (ICCV), Korea.

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## Publication

- 2022 **Innani, S.**, Dutande, P., Baheti, B., Baid, U. and Talbar, S., Deep Learning based Novel Cascaded Approach for Skin Lesion Analysis. 7th International Conference on Computer Vision & Image Processing, Nagpur, India (Accepted).
- 2022 Fang H, Li F, Fu H, Sun X, Cao X, Son J, Yu S, Zhang M, Yuan C, Bian C, Lei B., Ujjwal B, **Shubham I** and others, REFUGE2 Challenge: Treasure for Multi-Domain Learning in Glaucoma Assessment. arXiv preprint arXiv:2202.08994. 2022 Feb 18. (Under review at IEEE TMI).
- 2022 Fang H, Li F, Fu H, Sun X, Cao X, Lin F, Son J, Kim S, Quéllec G, Matta S, Shankaranarayana SM, Ujjwal B, **Shubham I** and others, ADAM Challenge: Detecting Age-related Macular Degeneration from Fundus Images, in IEEE Transactions on Medical Imaging, doi: 10.1109/TMI.2022.3172773.
- 2021 Bhakti Baheti, **Shubham Innani**, Suhas Gajre and Sanjay Talbar, Pedestrian Detection and Movement Direction Recognition with Convolutional Neural Network. 9th International Conference on Pattern Recognition and Machine Intelligence. 2021 December. (Accepted).
- 2021 **Innani, S.**, Dutande, P., Baheti, B., Talbar, S., and Baid, U. Fuse-PN: A Novel Architecture for Anomaly Pattern Segmentation in Aerial Agricultural Images. In Proceedings of the IEEE CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops(pp. 2960-2968).
- 2020 M. T. Chiu,X. Xu, K. Wang, J.Hobbs, Brunner R., Andrew Ng, U. Baid, **S. Innani**, P. Dutande, B. Baheti, S. Talbar, "The 1st Agriculture-Vision Challenge: Methods and Results," 2020 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW), 2020, pp. 212-218, doi: 10.1109/CVPRW50498.2020.00032.
- 2020 Bhakti Baheti, **Shubham Innani**, Suhas Gajre, Sanjay Talbar. Semantic scene segmentation in unstructured environment with modified DeepLabV3+. Elsevier Pattern Recognition Letters, Volume 138, 2020, Pages 223-229, ISSN 0167-8655,doi: 10.1016/j.patrec.2020.07.029.
- 2020 B. Baheti\*, **S. Innani\***, S. Gajre and S. Talbar, "Eff-UNet: A Novel Architecture for Semantic Segmentation in Unstructured Environment," 2020 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW), 2020, pp. 1473-1481, doi: 10.1109/CVPRW50498.2020.00187. (\*contributed equally)

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## Projects

- **Prognostic Stratification of Glioblastoma**  
Focus is to develop a computational algorithm for survival prediction of GBM patients based on digital H&E stained whole slide images (WSI) using weakly supervised approach. We also aim at interpretability analysis i.e. the important regions from WSI driving the decision.

- **Automatic Number Plate Recognition**  
Focus was on the development of novel and realtime algorithms for Automatic Number Plate Recognition. This algorithm implements end-to-end You Only Look Once (YOLO) based object detector and Mask-RCNN based Region Proposal Network.
- **Retinal Fundus Glaucoma Analysis (REFUGE2 Challenge, MICCAI 2020)**  
Algorithm for Retinal Fundus Glaucoma Analysis with segmentation of optic disc and cup, classification of glaucoma and localization of fovea is being developed. We leverage the power of Efficientnets and Unet for all the tasks.
- **Anomaly Pattern Segmentation in Agriculture(Agriculture Vision Challenge, CVPRW 2020)**  
Novel and effective algorithms is developed for agricultural pattern recognition from aerial images using Feature Pyramid Network as encoder and varying the decoder backbones.
- **Age Related Macular Degeneration (AMD Challenge, ISBI 2020)**  
Development of algorithms associated with the diagnosis of Age-related Macular degeneration (AMD) and segmentation of lesions in fundus photos from AMD patients with Convolutional Neural Networks.
- **Semantic Scene Segmentation in Unstructured Environment (AUTONUE Challenge, ICCV 2019 & NCVPRIPG Challenge 2019 & ICVGIP Challenge 2020)**  
Encoder-Decoder architecture is developed for semantic scene segmentation in unstructured environment with various backbones like InceptionResNetV2, EfficientNets using Deep Learning on Indian Driving Dataset (IDD) and IDD lite.
- **Skin lesion Segmentation and Classification (ISIC Challenge, MICCAI 2018)**  
Generative Adversarial Network based architecture is developed for skin lesion segmentation and classification with Convolutional Neural Network. The classification task is carried out with state-of-the-art networks like ResNets, MobileNets, Xception, EfficientNets.

## Skills

AI Tools	Convolutional Neural Network (CNN), Segmentation Models, CNN based classification models, Object detection models, Generative Adversarial Networks (GAN)
Libraries	Keras, Tensorflow, Numpy, Pandas, Pytesseract, Scikit-Learn, Scikit-Image, Openslide, Pytorch (Beginner)
Outros	Python, C, Colab, GPU, SCRUM, SPRINT, Git

## Reviewer Experience

IEEE Transaction in Medical Imaging  
Nature Scientific Reports  
IEEE Computer Vision and Pattern Recognition (Workshops)

## Certifications

Deep Learning Specialization by deeplearning.ai on Coursera by Andrew Ng  
AI for Medicine on Coursera

Neural Networks and Deep Learning by deeplearning.ai on Coursera

Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization by deeplearning.ai on Coursera

Structuring Machine Learning Projects by deeplearning.ai on Coursera

Convolutional Neural Networks by deeplearning.ai on Coursera

Sequence Models by deeplearning.ai on Coursera

Convolutional Neural Networks in TensorFlow by deeplearning.ai on Coursera

Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning by deeplearning.ai on Coursera

Deep Neural Networks with PyTorch on Coursera

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## About me

I aim to work in an organization with research-based opportunities where I can utilize my skills to achieve the organization's objective and grow personally and professionally. Despite the short period of experience in the research sector, I have interest willingness to learn new things.

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## Personal Details

Date of Birth 8<sup>th</sup> September 1998

LinkedIn <https://www.linkedin.com/in/shubhaminnani>

GitHub <https://github.com/shubhaminnani>

Google Scholar <https://scholar.google.com/citations?user=Aw0CjT8AAAAJ&hl=en>

Website <https://shubhaminnani.github.io/>

Name: Shubham Innani

Place: Philadelphia, PA, USA

Date: 9<sup>th</sup> January, 2023