Shravan Ambudkar

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RESEARCH EXPERIENCE

PIXXEL SPACE **Bengaluru, India**
Research Analyst | Advisor - Dr. RahulRaj *August 2021–Present*

- Developed an Artificial Neural Network based biophysical and biochemical properties estimation model for crops using multi-spectral and hyperspectral reflectance data.
- Created a Forest Tree classification Deep Learning model for the complete Europe region for 20 different tree species using multi-spectral and Hyperspectral reflectance and radiance data.
- Developed and maintained satellite data correction pipeline for Pixxel's Hyperspectral Imagery satellite using both Physics based and Machine Learning based models.
- Collected UAV based Hyperspectral data and developed a pipeline for processing and GPS based stitching of the data. Trained machine learning models to derive agricultural insights from the dataset.

EKKLAVYA INFOSYS **Pune, India**
Research Intern | Advisor - Ms. Shraddha Surana *August 2020–January 2021*

- This was a joint internship under ThoughtWorks Technologies and Ekklavya Infosys.
- Developed and worked on few-shot Meta-Learning algorithms for RGB images, Hyperspectral images and text sentence classification which showed significant accuracy of 93% for classification by training on a very limited training data-set consisting of 25 images and 25 text sentences.

Indian Institute of Technology, Mumbai **Mumbai, India**
Summer Research Intern | Advisor - Dr. J. Adinarayana *May 2020–July 2020*

- This internship was a part of Indo-Japan Project "Data Science-based farming support system (DSFS)" undertaken in the Agro-Informatics Lab, CSRE, IIT-Bombay along with Monash University, Australia.
- Worked on different Deep Learning models for counting of maize tassels from drone-based RGB images and achieved an robust F1-score of 85.9% for accurate maize tassel counts.

EDUCATION

SYMBIOSIS SKILLS and PROFESSIONAL UNIVERSITY **Pune, India**
Bachelor of Technology in Mechatronics Engineering, *May 2021*
Honors: Distinction (CGPA: 8.67/10.0)

PUBLICATIONS

1. S. Surana, **S. Ambudkar**, P. Bihani. "A Comparative Study on Metric Based Meta Learning Approaches for Few-shot Image and Text Classification". *(The 13th International Conference on Communications, Computing and Data Security, AIP Conf. Proc. 2842, 020012 (2023))*

2. **S. Ambudkar**, R. Raj, K. Billa and R. Hukumchand, "Super-Resolution for Cross-Sensor Optical Remote Sensing Images," *IGARSS 2022 - 2022 IEEE International Geoscience and Remote Sensing Symposium*, 2022, pp. 1880-1883.
3. **S. Ambudkar**, R. Joshi, A. Kadam, K. Jadhav, Dr. S. Sonawane, " Autonomous Drone for Emergency Supplies Delivery during Disasters", *International Journal of All Research Education & Scientific Methods*, Issue 6 (June 2021)

SELECTED PROJECTS

Crop Biophysical and Biochemical parameters estimation using Hyperspectral and Multi-spectral Data.
Work Research Project at Pixxel Space (January 2023– September 2023)

- Designed an ANN model for pixel-wise estimation of parameters (Chlorophyll, LAI, Brown Pigment) across varied resolutions and data types (aerial, satellite images).
- Model addressed spectral irregularities like oxygen notch, missing bands, and red-edge shift, enhancing adaptability to diverse scenarios in remote sensing.
- The model demonstrated superior qualitative performance compared to ESA-SNAP's Crop Parameter estimation.

Land Use Land Classification of Hyperspectral Data
Personal Project (July 2021)

- Developed a Artificial Neural Network model that takes Hyperspectral Satellite Imagery as inputs and generates a Land Use Land Classification map based on the imagery (mapping each pixel into classes and subclasses).
- Major classes such as Agriculture, Urban, Water bodies. Subclasses such as crop types, urbanisation level, type of water body, type of forest, crop species in agriculture land.
- Obtained a robust map-classification accuracy of 91%.

Autonomous Drone for Disaster Management
Undergraduate Thesis Project (January 2021– June 2021) || Guide - Dr. Santosh Sonawane

- Awarded Best Interdisciplinary Thesis 2021, School of Mechatronics Engineering
- The drone's objective is autonomous search in disaster areas, reporting victim locations to the operator for efficient response and assistance.
- A multi-disciplinary project employed SLAM, Computer Vision with YOLO-v5 for object detection, and U-Net for segmentation, integrating diverse navigation and Deep Learning technologies.

ACHIEVEMENTS

- Appointed as a core committee member of the Robotics Club at the University.
- Lead a team of 6 members in National level Smart India Hackathon 2020 and 2021.
- Finalist for consecutive 3 years at IIT Bombay Techfest's International Robotics Challenge.
- Anti Ragging committee member in the University.
- Finalist - AtmaNirbhar Bharat TOYCATHON 2021, Organised by Ministry of Education, India.

SKILLS

Languages : Python, C/C++
ML Tools and Frameworks : TensorFlow, PyTorch, Numpy, Matplotlib, Sklearn, Plotly.
Tools/Frameworks : QGIS, ENVI, GDAL, Rasterio, Geopandas, ArcGIS, ROS/ROS 2.