Shravan Ambudkar

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RESEARCH

Broader Vision: Building Generalisable and Interpretable AI for Environmental Sustainability and Conservation leveraging Computer Vision and Multi-Modal data.

EDUCATION

SYMBIOSIS SKILLS and PROFESSIONAL UNIVERSITY **Pune, India**
Bachelor of Technology in Mechatronics Engineering, *June 2017 - May 2021*
Grade: Distinction (CGPA: 8.6/10.0)
Thesis: Autonomous Drone for Disaster Management | Advisor - Dr. Santosh Sonawane

RESEARCH EXPERIENCE

PIXXEL SPACE **Bengaluru, India**
Research Analyst | Advisors - Dr. Rahul Raj & Dr. Logan Wright *April 2022 - Present*
Research Intern | Advisor - Dr. Rahul Raj *August 2021 – March 2022*

- Developed a Data-Centric Neural Network for estimating properties of farm-canopies using multi-sensor hyperspectral (HSI) and multispectral data leveraging Radiative Transfer Models (RTMs).
- Developed A Hierarchical approach by Sequential Cascading of XGBoost Classifiers for identification and mapping abundance for Forest Tree Species in the Conterminous US region using HSI data.
- Developed and maintained satellite data correction pipeline (L0 to L2A) for Pixxel's hyperspectral imagery satellite using both physics and machine learning based models.

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 image and sentence classification by training on a limited training data-set consisting of 25 images and 25 text sentences.
- Models trained and evaluated - Siamese, Prototypical, Relation and Matching Networks.

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 Yolo and Fast-RCNN frameworks for counting of maize tassels from drone-based RGB images and achieved an robust F1-score of 85.9% for accurate maize tassel counts.

PUBLICATIONS

1. **S. Ambudkar**, L. Wright. “A Hierarchical Cascaded Approach to Classifying Forest Type and Tree Species in Hyperspectral Remote Sensing Data”. *14th IEEE Workshop on Hyperspectral Imaging and Signal Processing: Evolution in Remote Sensing, Helsinki, Finland, 2024. (To be presented)*
2. A. Joshi, S. Banerjee, **S. Ambudkar,** R. Raj, L. Wright. “A Fused Approach to Spatial Statistical Noise Removal using Adaptive Median Filters and Spectral Unmixing”. *14th IEEE Workshop on Hyperspectral Imaging and Signal Processing: Evolution in Remote Sensing, Helsinki, Finland, 2024. (To be presented)*
3. 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)*
4. **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.
5. **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)

In Preparation:

1. **S.Ambudkar,** R. Raj, L. Wright “Estimating Crop Biophysical and Biochemical Properties from Multi-Sensor Hyperspectral Imagery: A Data-Centric Deep Learning Approach”. *Planned to submit in Remote Sensing of Environment Journal.*

ACHIEVEMENTS & AWARDS

- Winner [Represented Pixxel Space] - DIU & iDEX (India) Maritime ISR Challenge (2024)
- Finalist - AtmaNirbhar Bharat TOYCATHON (2021)
- Faculty Choice - Committee member, Robotics Club at the Undergraduate University - (2019 to 2021)
- University winner - National Smart India Hackathon - (2020, 2021)
- Awarded technical grant to participate at IIT, Bombay, Techfest competition (USD 500) - (2018)
- Faculty Choice- Student head, Anti Ragging committee at the Undergraduate University - (2017-2018)

SKILLS

Languages : Python, MATLAB, C++, Golang.
ML Tools and Frameworks : TensorFlow (Keras), PyTorch, Numpy, Matplotlib, Sklearn, Plotly, Dask.
Tools/Frameworks : Git, QGIS, ArcGIS, ENVI, GDAL, Rasterio, Geopandas, AWS, Azure Cloud.

Certifications and Additional Courses

From Deep Learning Foundation to Stable Diffusion — **Fast.ai**
Fast.ai — *2024*

Fundamentals of GIS - 4 Courses — **Coursera**
University of California, Davis — *2023*

Deep Learning - 5 Courses — **Coursera**
DeepLearning.Ai — *2021*

Applied Data Science with Python - 5 Courses — **Coursera**
University of Michigan — *2020*

MATLAB Self Paced Online Courses - 5 Courses — **MathWorks**
MathWorks — *2020*

AFFILIATIONS

Forecastro **Pune, India**
External Consultant working on predicting climate change through the intersection of AI and satellite based meteorological data. *Jan 2024 - Present*

Shantikalp **Pune, India**
Director and mentor for high school children promoting research, innovation and entrepreneurship. *July 2022 – Present*

OUTREACH

Robin Hood Army NGO, Pune **Pune, India**
Summer Science Tutor for underprivileged children struggling with topics related to Maths and Science. *May 2019 – July 2022*

Snehwan NGO, Pune **Pune, India**
Volunteer - Helping with research projects and documenting the NGO's activities and impact, vital for reporting and future planning. *Feb 2017 – Dec 2018*