

Venkanna Babu Guthula

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SUMMARY

Ph.D. student specializing in computer vision for Earth observation, with three years of industry and research experience in image analysis and machine learning. Interested in developing computer vision and machine learning methods that extract meaningful insights from images and complex datasets for real-world applications.

EDUCATION

Ph.D. in Computer Vision for Earth Observation

02/2023 - Present

Department of Computer Science, University of Copenhagen, Denmark

- **Thesis:** Computer vision for mapping vector-borne disease risk factors in Africa
- Develop methods using convolutional neural networks and vision transformers for individual object detection, segmentation and classification
- Implement a framework to align and segment objects in satellite imagery using potential misaligned labels
- Develop methods to detect tiny objects in satellite imagery using point labels
- Work with multiple high-resolution image products from Planet and Vantor
- Co-supervise multiple bachelor's and master's students for their theses, and work as a teaching assistant for machine learning courses

M.Sc. in Geo-Information Science & Earth Observation

09/2018 - 06/2020

Faculty of Geo-Information Science and Earth Observation, University of Twente, the Netherlands

- **Thesis:** Automatic road extraction from high-resolution remote sensing imagery using fully convolutional networks and transfer learning
- Built a strong foundation in machine learning and remote sensing
- Worked with machine learning frameworks such as PyTorch and TensorFlow
- Gained hands-on experience in geospatial data analysis using Python, JavaScript, R, and GIS software (QGIS, ArcGIS, and SNAP)

B.Tech. in Geo-Informatics

09/2014 - 03/2017

Department of Geo-Engineering, Andhra University, India

- **Thesis:** Web-GIS-based comparative analysis of rainfall in the Thatipudi reservoir catchment area and its impact on reservoir capacity
- Worked on estimating rainfall and water surface area using satellite imagery
- Developed a web-based application for geospatial data visualization

EXPERIENCE

Scientist I - EO

12/2021 - 01/2023

CropIn Technology Solutions, Bangalore, India.

- Developed a scalable model for cloud and shadow detection in Sentinel-2 imagery using classical machine learning algorithms
- Leveraged AWS services to develop scalable machine learning pipelines for large-scale satellite imagery analysis
- Established proof of concepts of mapping agriculture field boundaries and biophysical parameters from satellite imagery

GIS-Python Developer

09/2020 - 12/2021

Wildlife Institute of India, Dehradun, India

- Developed deep learning models for species classification using MegaDetector as the detection backbone
- Maintained and contributed to *Linkage Mapper*, a tool for mapping wildlife corridors
- Performed remote sensing image classification using machine learning algorithms in Google Earth Engine

Map-Technician

09/2017 - 09/2018

Mapbox Technologies, Bangalore, India

- Researched and designed workflows to improve transportation map data for enhanced navigation experiences
- Planned and organized field mapping events for large-scale geospatial data collection
- Added, validated, and enhanced base data in OpenStreetMap using GPS data, remote sensing imagery, and street-level imagery

TECHNICAL SKILLS

- **Programming:** Python, JavaScript, R, and Bash
- **Frameworks:** PyTorch, TensorFlow, JAX, scikit-learn, NumPy, Pandas, and SciPy
- **Geospatial tools:** GDAL, Rasterio, GeoPandas, Google Earth Engine, and QGIS
- **Cloud & MLOps:** AWS, LUMI, Git, Linux, Weights & Biases, and TensorBoard

ACHIEVEMENTS

2020 Awarded the Golden Jubilee Scholarship by the Indian Institute of Remote Sensing for outstanding performance in M.Sc.

2019 Received a scholarship to attend and present a lightning talk at the *State of the Map Asia 2019* Conference, Dhaka, Bangladesh

LANGUAGES

Telugu, English and Hindi

SELECTED CONFERENCE PAPERS

Guthula, V. B., Kehlet, J. J. Å., Kariryaa, A., Lang, N., Oehmcke, S., & Igel, C. (2025). Beyond building footprints: Probing DINOv3 to map roof material and geometry. *1st Workshop on Advances in Representation Learning for Earth Observation (REO @ EurIPS 2025)*.

Guthula, V. B., Krause, O., Gominski, D., Zhang, H., Mottelson, J., Kariryaa, A., Lang, N., & Igel, C. (2026). Align and segment: Unsupervised learning for building segmentation from misaligned labels. *European Conference on Computer Vision (ECCV)*.

SELECTED JOURNAL PAPERS

Brandt, M., Gominski, D., Reiner, F., Kariryaa, A., **Guthula**, V. B., Ciais, P., Tong, X., Zhang, W., Govindarajulu, D., Ortiz-Gonzalo, D., et al. (2024). Severe decline in large farmland trees in India over the past decade. *Nature Sustainability*, 1–9.

Guthula, V. B., Shrotriya, S., Nigam, P., Goyal, S. P., Mohan, D., & Habib, B. (2022). Biodiversity significance of small habitat patches: More than half of Indian bird species are in academic campuses. *Landscape and Urban Planning*, 228, 104552.