PADMAGEETHA NAGARAJAN

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EDUCATION

University of Maryland, College Park   *Maryland, USA*
Doctor of Philosophy in Geographical Sciences   *2024 – Present*

Faculty of Geo-Information Science and Earth Observation (ITC),
University of Twente   *The Netherlands*
Master of Science in Geo-Information Science and Earth Observation   *2022 – 2024*
Specialization: Natural Resources Management
- Cumulative **GPA:** 8.4/10
- **Thesis:** Detection of wheat lodging using hyperspectral data

Anna University (Campus: College of Engineering Guindy)   **India**
Bachelor of Engineering in Geo-Informatics   **2016 – 2020**
- Cumulative **GPA:** 8.84/10
- **Thesis:** A hybrid approach of Ant Colony Optimization (ACO) and Genetic Algorithm (GA) based Super Resolution Mapping of water bodies in Chennai city, south India

PUBLICATIONS (Peer-Reviewed)

- Nagarajan, P., Rajendran, L., Pillai, N.D., Lakshmanan G. Comparison of machine learning algorithms for mangrove species identification in Malad creek, Mumbai using WorldView-2 and Google Earth images. **Journal of Coastal Conservation 26**, 44 (2022). https://doi.org/10.1007/s11852-022-00891-2

In preparation

- Nagarajan, P., Darvishzadeh, R., Celik, M.F., Boschetti, M., Nelson, A. Estimation of Wheat Lodging Severity: A Comparative Study of Hyperspectral and Multispectral Remote Sensing Approaches. **Remote Sensing of Environment**
- Nagarajan, P., Cyril, G.H., Shanmugam, S. A hybrid approach to Super-Resolution Mapping of reservoir boundary from multidate Landsat OLI images using Ant Colony Optimization and Genetic Algorithm. **International Journal of Remote Sensing**

PRESENTATIONS (Conference/ Symposium)

- Nagarajan, P., Darvishzadeh, R., Nelson, A., 2024. Hyperspectral remote sensing of Wheat Lodging: An Insight into Its Physiology. 13th EARSeL Workshop on Imaging Spectroscopy in València, Spain
- Nagarajan P., Shanmugham S. Visualising an indicator of economic slowdown in multidate satellite images. 2020. National Conference on Application of Geospatial Technologies in Management of Natural Resources and Disaster, The Gandhigram Rural Institute, Tamil Nadu
- Nagarajan P., Shanmugham S. Multispectral satellite sensing for comparative studies on land degradation in south India due to oil-leak and tannery effluents. 2019. 7th International Conference on Contemporary Engineering and Technology'19, Chennai
- Nagarajan P., Kannan U. A study on the potential of Sentinel-2 multispectral images to map the crude-oil leak affected areas of Thanjavur and Thiruvarur districts, South India. 2018. National Conference on recent innovations in Civil Engineering, Chennai
- Nagarajan P. Recent changes in summer monsoon onset dates over South and East Asia. 2019. Celestia, an intra college symposium, Anna University
- Nagarajan P. Land Surface Temperature modelling for snow covered regions. 2018. Kurukshetra, an international techno-management fest (UNESCO patronage), Anna University
- Nagarajan P., Afshaan T. Artificial Intelligence in agriculture: An intelligent virtual assistant for farmers. 2017. Celestia, an intra-college symposium, Anna University
- Nagarajan P., Alphonse R. Swachh Bharat (Clean India). 2016. National Service Scheme foundation day. Anna University

RESEARCH EXPERIENCE

Deutsches Zentrum für Luft- und Raumfahrt (DLR), The German Aerospace Center   *May 2024 – Jun 2024*
- Interned in the Earth Observation Centre under Dr. Ursula Gessner and Dr. Andreas Hirner and worked on pre-processing steps of spatial big datasets for automatic classification of hedgerows in Bavarian region using High Performance Computing (HPC) clusters.

Faculty of Geo-Information Science and Earth Observation (ITC)   *Feb 2023 – Jul 2024*
Worked on the EO4CerealStress: Wheat Lodging project as part of my thesis under Dr. Roshanak Darvishzadeh, Associate Professor, ITC
- Led the field campaign where various lodging, biochemical, and biophysical parameters such as crop angle inclination, lodged area, chlorophyll, LAI, plant density, canopy height, fresh biomass, dry biomass, etc. were collected.
- Collected lodged and healthy wheat spectral measurements using the ASD spectrometer.
- Detection of wheat lodging and its severity using field and satellite-level hyperspectral datasets.

Faculty of Geo-Information Science and Earth Observation (ITC)   *Nov 2022 – Feb 2023*
- Performed pre-processing tasks such as resampling to different spatial and spectral resolutions, continuum removal, and principal component analysis of AVIRIS hyperspectral data for mapping species richness in tropical forests.

Indian Institute of Space Science and Technology   *May 2021 – Jun 2022*
- Extended the classification of mangrove species project, performed PCA analysis, improved the accuracy of object-based classification results using various object-based features.
- Wrote a manuscript and published this work in the Journal of Coastal Conservation, a Springer journal.

Anna University   *Dec 2017 – Sep 2020*
Carried out the following projects under Dr. S. Sanjeevi, Professor of Remote Sensing, Anna University:
- Mapped crude-oil leak affected vegetation, soil, and water bodies in Thanjavur and Thiruvarur districts, South India using Sentinel – 2 satellite images.
- Comparative studies on land degradation in south India due to oil-leak and tannery effluents using Landsat and Sentinel – 2 images.
- Visualizing economic slowdown in India through satellite images.
- A hybrid approach of Ant Colony Optimisation and Genetic algorithm based Super Resolution Mapping of water bodies in Chennai city, south India **(Thesis)**

Indian Institute of Space Science and Technology   *May – Jun 2019*
- Interned under Dr. L. Gnanappazham, Associate Professor, Department of Earth and Space Sciences through **Summer Research Internship Programme'19** and worked on classification of mangrove species in WorldView-2 and Google Earth Pro images using machine learning algorithms (Random Forest and KNN) in the pixel-based and object-based approaches.

Indian Institute of Science   *May – Jun 2018*
- Interned under Dr. Arindam Chakraborty, Associate Professor, Centre for Atmospheric and Oceanic Sciences through **Science Academies Summer Research Fellowship Programme'18** and worked on recent changes in summer monsoon onset dates over South and East Asia**.** Analysed the recent changes in Asian summer monsoon onset dates and its relationship to atmospheric parameters such as precipitable water, surface pressure and winds.

Defence Research and Development Organisation | CEG Tech Forum   *July – Nov 2017*
- Carried out a project entitled 'Land Surface Temperature modelling for snow covered regions' under **Dr. Sujata Dash, Defence Research and Development Organisation** of India**.** Developed a spectral index to estimate fractional snow cover from Landsat-8 thermal images.

TECHNICAL SKILLS

- **Programming languages:** Python, Matlab, R
- **GIS:** QGIS, ArcGIS
- **Digital Image Processing:** Erdas Imagine, ENVI, eCognition
- **Other:** Google Erath Engine

AWARDS

- **First prize** in Paper presentation event of Celestia'19, an intra college symposium for the paper 'Recent changes in summer monsoon onset dates over South and East Asia'
- **Best paper award** for the paper entitled 'A study on the potential of Sentinel-2 multispectral images to map the crude-oil leak affected areas of Thanjavur and Thiruvarur districts, South India' in National Conference on recent innovations in Civil Engineering'18, Chennai
- **First prize** in Paper Presentation event of Celestia'17 for the project idea 'Artificial Intelligence in agriculture: An intelligent virtual assistant for farmers'
- **Second prize** for the 'Swachh Bharat (Clean India)' poster in NSS foundation day'16 organised by CEG, Anna University

FELLOWSHIPS

- UMD Dean's Fellowship (2024)
- Erasmus+ Scholarship (2024)
- UT travel fund (2023)
- ITC Excellence Scholarship Programme (2022)
- Science Academies Summer Research Fellowship (2018)

LEADERSHIP EXPERIENCE

- **Student Member** of the Programme Committee of the ITC in assuring the quality of education **Jan-Dec 2023** offered by the ITC
- **Chief editor** of Spatia magazine published by the Society of Geo-Informatics Engineers **Jul'19-Mar'20**
- **Organizer** for paper presentation event of Celestia, an Intercollege technical symposium **Jan 2019**
- **Organizer** for paper presentation event of Geo Horizon, an Intercollege technical symposium **Mar 2019**
- **Coordinator** for paper presentation event of Geo Horizon, an Intercollege technical symposium **Mar 2018**
- **Volunteer** for 'Return on Investment' event of Kurukshetra, an international techno-management Fest (UNESCO patronage) **Feb 2017**
- **Volunteer** at NSS (National Service Scheme), CEG, Anna University **Aug'16-July'17**