+43 67764337056
Vienna, Austria
pmugudasanjeevamurthy@gmail.com

Pavan Muguda Sanjeevamurthy

LinkedIn: PavanMugudaSanjeevamurthy

With a **Master's in remote sensing** and over more than **three years of professional experience**, I specialize in developing **data processing pipelines** for diverse **Earth observation applications**. I am passionate about applying my expertise in algorithm development, utilizing a vast spectrum of EO datasets and machine learning techniques. I am **actively seeking full-time opportunities** to contribute to the forefront of remote sensing innovation.

Education

Master of Science in Earth Oriented Space Science Technology,
Technical University of Munich, Aerospace Geodesy, **Oct 2019 - May 2022**
Master's Specialization: Remote Sensing
Bachelor of Engineering in Mechanical Engineering,
Nitte Meenakshi Institute of Technology **Jun 2013 - Apr 2017**

Skills

Programming and OS	Python, MATLAB, IDL, C, Julia, Linux, MacOS, Windows
Softwares/Tools	Google Earth Engine, ESA SNAP, LaTex, Docker
GIS softwares	ArcGIS, QGIS
Project Management	Git, CI and CD
Languages	English, Kannada, Hindi, Telugu

Professional Experiences

Project Assistant/Projects: ROSSIHNI and Clim4Cast **Oct 2022 - current**
Technical University of Wien *Vienna, Austria*

- Development of drought indicators workflow for HSAF Surface Soil Moisture at 6.25km sampling for climate data record and near-real time data
- Quality Assurance of ASCAT 6.25km product over East Africa.
- Evaluation and analysis of drought indicators based on ASCAT SSM 6.25km
- Refactoring and optimizing pipelines for generating down-scaling parameters based on Sentinel-1 data.
- Generation and quality assurance of ASCAT Surface Soil Moisture at 0.5km sampling for Europe
- Conducted a climate use case for investigating monsoon intensification in India.

Research Assistant **Aug 2022 - Nov 2022**
Universität der Bundeswehr Munchen *Munich, Germany*

- Development of self-supervised learning framework for InSAR Phase and Coherence Estimation.
- Development of pre-processing pipeline for Persistent Scatter Interferometry based on Sentinel-1 data

Student Research Assistant **Feb 2022 - Jun 2022**
Technical University of Munich *Munich, Germany*

- Development of algorithm to filter buildings from 3D city-models based on GMLIDs
- Algorithm to calculate shadow volumes, occlusions and visible parts of buildings

Master Thesis Student / Project: InSAR Denoising using Self-Supervised Learning **Nov 2021 - May 2022**
Data Science in Earth Observation, TUM *Munich, Germany*

- Generation of simulated SAR interferograms using SRTM DEM (30m*30m).
- Pipeline for generating SAR interferograms of simple 2d signals: 2D Gaussian peaks, Cone, Linear ramps, Squares.
- Preparation train and test simulated dataset using azimuthal split spectrum method.
- Development of Complex-valued UNet with NAB(non-local attention blocks) for denoising the InSAR phase
- Case studies using simulated InSAR data for understanding proposed model performance.
- Comparison and analysis of denoised results of simulated data with state of the art InSAR filters

Research Intern / Project: InSAR Denoising using Self-Supervised Learning **April 2021 - Sep 2021**
Data Science in Earth Observation, TUM *Munich, Germany*

- Research on existing deep-learning techniques for denoising the InSAR phase and coherence.
- Development of complex valued U-net with residual blocks for denoising InSAR data.
- Analysis of denoising results from the proposed network for simulated InSAR data.
- Experiments to optimize the network architecture to preserve high-frequency parts of the InSAR phase.
- Analysis of denoising results from the proposed network for real InSAR data.

Student Assistant/ Project: Add-on's for IWAP Processor **April 2020 — Sep 2021**
Deutsches Zentrum fur Luft- und Raumfahrt (DLR) *Oberpfaffenhofen, Munich, Germany*

- Development of standalone Python GUI code to extract and visualize SAR image chips in Sentinel-1 SLC data (SM and IW modes)
- SNAP plugins for extracting chips around corner reflectors in SAR image products.
- Python visualization libraries for multitemporal SAR, InSAR amplitude, phase and coherence
- Porting of the existing algorithm for co-registration of master and slave images in TOPS mode using enhanced spectral diversity technique (ESD) from IDL to python

CAE Automation Engineer **Sep 2018 - Aug 2019**
BETA CAE Systems *Bangalore, India*

- Python scripting and plugins for automation of various pre-processing and post-processing steps of the CAE design process
- Customer support in terms of the python code deliverables for our clients.

Projects

Modelling Uncertainties in urban land use segmentation using probabilistic U-Net **Nov 2021 —June 2021**
The project's main objective is to generate several segmentation variants for urban land use using probabilistic UNet and calculate pixel-wise uncertainty

- Development of the pipeline in Python: data loading, training and testing
- Generation of uncertainty maps from segmentation variants.

Geo-spatial Assessment of Urban Farming Potential in Metropolitan Areas **Nov 2021 —June 2021**
The project's main objective is to detect potential rooftops and vacant parcels in the cities

- Responsible for coding and visualization of the results in Google Earth Engine

Design and Analysis of Halo Orbit Mission around L1 Libration Point in Sun-Earth System **June 2016 —April 2017**
Bachelor Thesis

- Implemented differential correction and differential evolution methods to determine initial conditions for Halo orbits near L1 libration point of Sun-Earth system

Conferences

A Case Study on Agricultural Drought Monitoring using ASCAT Surface Soil Moisture at 6.25 km sampling over Eastern Africa **April 2024**
Pavan Muguda Sanjeevamurthy, Mariette Vreugdenhil, Sebastian Hahn, Samuel Massart, Carina Villegas-Lituma, Roland Lindorfer, and Wolfgang Wagner
EGU General Assembly Conference Abstracts, EGU24-6782

Drought monitoring and early warning with satellite soil moisture data **April 2024**
Mariette Vreugdenhil, Samuel Massart, Pavan Muguda Sanjeevamurthy, Carina Villegas-Lituma, Markus Enenkel, and Wolfgang Wagner
EGU General Assembly Conference Abstracts, EGU24-19536

High-resolution drought monitoring with Sentinel-1: A case-study over Mozambique **April 2024**
Samuel Massart, Mariette Vreugdenhil, Sebastian Hahn, Pavan Muguda Sanjeevamurthy, Carina Villegas-Lituma, and Wolfgang Wagner
EGU General Assembly Conference Abstracts, EGU24-5291

Metop ASCAT soil moisture trends: Mitigating the effects of long-term land cover changes **May 2023**
Sebastian Hahn, Wolfgang Wagner, Oto Alves, Pavan Muguda Sanjeevamurthy, Mariette Vreugdenhil, Thomas Melzer
EGU General Assembly Conference Abstracts, EGU-16205

Self-Supervised Learning for InSAR Phase and Coherence Estimation **July 2023**
Francescopaolo Sica, Pavan Muguda Sanjeevamurthy, Michael Schmitt
IGARSS 2023-2023 IEEE International Geoscience and Remote Sensing Symposium

Improving 1km Sentinel-1 Soil Moisture Retrievals by Optimizing Backscatter Preprocessing Workflows **May 2023**
Wolfgang Wagner, Samuel Massart, Bernhard Raml, Raphael Quast, Pavan Muguda Sanjeevamurthy, Claudio Navacchi, Felix Reuß, Bernhard Bauer-Marschallinger, Mariette Vreugdenhil
EGU General Assembly Conference Abstracts, EGU-7441

Honours

Deutschlandstipendium Scholarship **Oct 2019 —Sep 2020**
Prestigious Deutschland STIPENDIUM awardee for the year (2019/20), which the Federal Government of Germany gives and other Private Donors for academically excellent students