ForestSAT 2026

Association for Forest Spatial Analysis Technologies

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Title: Computational Co-Registration of GEDI footprints for Geolocation Error Correction

Instructors/Affiliation:

- Leonel Corado

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- Sergio Godinho EaRSLab - Earth Remote Sensing Laboratory, University of Évora, 7000-671 Évora, Portugal.

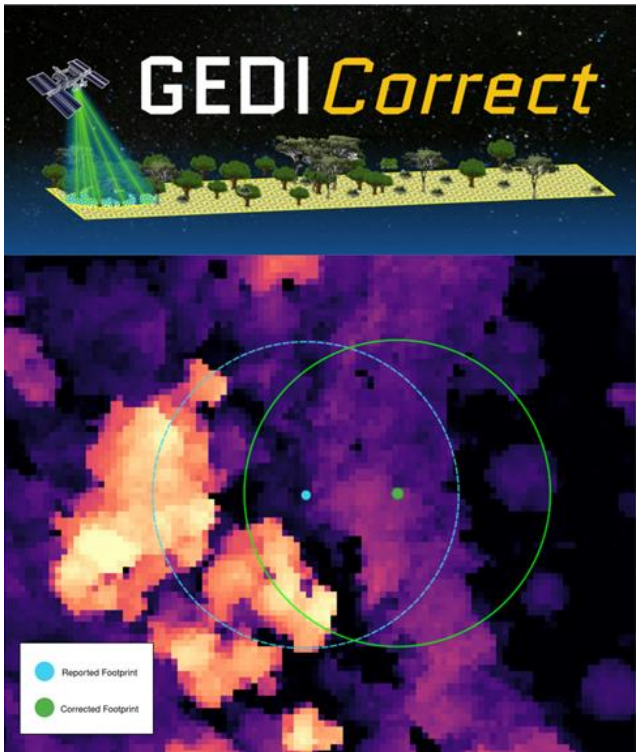
Description: This hands-on workshop introduces GEDICorrect, an open-source Python framework developed to enhance the spatial accuracy of GEDI data through advanced correction strategies. GEDICorrect integrates and extends current methods by combining waveform matching, terrain alignment, and relative height (RH) profile comparison, leveraging metrics such as CRSSDA and Kullback-Leibler (KL) divergence. The framework supports parallel processing for large-scale applications and allows correction at multiple levels (orbit, beam, and footprint). Participants will gain practical experience applying GEDICorrect to real GEDI datasets, exploring its potential to improve the integration of GEDI with other remote sensing datasets. This workshop is ideal for researchers, remote sensing analysts, and students working on forest structure, biomass modeling, or multi-sensor data fusion applications seeking to improve the spatial reliability of GEDI products.

Learning Objectives: By the end of the workshop, participants will:

- Understand common spatial accuracy challenges in GEDI data
- Learn the principles behind waveform matching, terrain alignment, and RH profile comparison
- Gain hands-on experience using GEDICorrect to correct GEDI data at multiple levels (orbit, beam, footprint)
- Become familiar with metrics such as CRSSDA and Kullback-Leibler (KL) divergence

- Explore how to integrate corrected GEDI data with other remote sensing datasets

Target audience: Researchers, students, and remote sensing professionals working with forest structure, biomass estimation, or multi-sensor data fusion who want to improve the spatial accuracy of GEDI products.



Format & Activities: The workshop includes a brief theoretical overview followed by hands-on exercises using real GEDI datasets. Participants will install and run the GEDICorrect Python framework, apply correction techniques, and evaluate improvements in spatial alignment using provided tools and metrics. Activities will also demonstrate parallel processing for large-scale analysis.

Expected outcomes: Participants will:

- Gain practical skills using the GEDICorrect open-source framework
- Understand and apply correction methods to improve GEDI spatial accuracy
- Learn to interpret correction metrics and evaluate results
- Be equipped to apply GEDICorrect in forest structure and data fusion projects

Language: English

Requirements: Computer with Ubuntu or Windows WSL with Python 3 (latest version), Anaconda and GCC installed.

Schedule: January 16, 2026 , 9:00 AM – 2:00 PM (EST)

Duration: 4 hours.

Biography

Sérgio Godinho is a Research Scientist specializing in Environmental Remote Sensing Applications. He has co-authored 38 scientific papers and two book chapters. His work focuses on Earth and Environmental Sciences, with an emphasis on remote sensing, vegetation structure and dynamics using multispectral, SAR, and LiDAR technologies; multi-scale and multi-sensor data fusion; biodiversity monitoring; wildland fuel mapping; and machine learning. Over the past five years, he has participated in multiple projects using GEDI and ICESat-2 LiDAR data, gaining a deep understanding of the strengths and limitations of these systems.

Leonel Corado holds a Master's Degree in Computer Science and is a Research Intern at the University of Évora, within the Mediterranean Institute for Agriculture, Environment, and Development (MED). His work focuses in developing scalable and accessible solutions for Remote Sensing Applications, which led to two open-source frameworks, GEDI-Pipeline and GEDICorrect, designed to efficiently process spaceborne LiDAR (GEDI) data for improved forest structural analysis and biomass estimation. His work continues to expand his expertise in geospatial science and environmental applications.

Agenda

Eastern Time (ET)	**Topic**	**Instructor**
9:00-9:30	Introduction to GEDI Data and Geolocation Errors	Sergio Godinho / Leonel Corado
9:30 – 10:30	Overview of the GEDICorrect Framework	Sergio Godinho / Leonel Corado
10:30 – 11:30	Theoretical Foundations of Spatial Correction	Sergio Godinho / Leonel Corado
11:30 – 12:30	**Break**	-
12:30 – 13:30	Installing and Running GEDICorrect	Sergio Godinho / Leonel Corado
13:30 – 14:00	Applied Correction Exercises on Real GEDI Data	Sergio Godinho / Leonel Corado