Postdoctoral position in Remote Sensing of Mangroves

This position is part of the Active and Passive Imagery for Oil Monitoring in Mangrove and Marine Environments (APIOM³E) project, which aims to develop multiscale, remote sensing approaches for mangrove forest mapping and health monitoring.

Because mangroves are constantly exposed to environmental stressors such as oil spills, continuous large-scale monitoring is critical to support their conservation. The new generation of drone (UAV) and spaceborne hyperspectral sensors has opened up promising perspectives for mangrove mapping and monitoring, which yet remain unexplored. The APIOM³E project seeks to evaluate the suitability of commonly-used and new-generation optical sensors to improve the monitoring of mangrove forests and their response to oil spills at various scales. More precisely, the objective is to develop relevant indicators of mangrove health that can be monitored by drone, airborne, and satellite sensors, from the tree to the landscape scale.

The successful candidate will explore the following components of the project:
- Mangrove extent and species mapping
- Tree crown delineation
- Biophysical and biochemical parameter retrieval (biomass, pigments, ...)
- Tree health discrimination and stress assessment in response to oil spills
- Oil spectral signatures

The successful candidate will exploit the available algorithms developed in the frame of the project and implement new approaches to achieve these goals. A particular interest is given to deep learning frameworks, although more traditional approaches are investigated too.

To develop these approaches, the project relies on multiscale remotely sensed data, including:
- UAV hyperspectral imagery and LiDAR
- Airborne hyperspectral imagery
- Spaceborne multi- and hyperspectral imagery (WorldView, Sentinel-2, DESIS, PRISMA, EnMAP)

The study site identified for the project is a degraded mangrove forest located in northeastern Brazil. Preliminary surveys have been carried out in the project and will be completed by new campaigns of field data and UAV image collection.

Therefore, the candidate is expected to organize and lead the field campaigns (flight lines, field sampling design, etc.).

The position will be held at the Geosciences Institute of the University of Campinas (UNICAMP), Brazil. The successful candidate will join a team of two post-docs (Dr Guillaume Lassalle and Dr Rebecca Scafutto) and graduate students, who work with Prof. Carlos Roberto de Souza Filho at UNICAMP on the project. The candidate should also collaborate with other research laboratories and environmental agencies. Depending on the needs, the candidate might be involved in other activities of the team (laboratory measurements, field campaigns, etc.).

Requirements for applicants:
- A PhD in remote sensing of vegetation or related field
- Experience in image processing, including multi- and hyperspectral imagery (drone, airborne, satellite)
- Fluency in coding (Python, R, Matlab), including image classification and segmentation
- Ability to conduct fieldwork in challenging conditions
- Knowledge in ecology and plant physiology would be appreciated

Required documents:
- CV with academic training and professional experiences
- Cover letter
- A list of publications
- Contact of two references
- Short description of research interests and plans for the position

Duration: 16 months (with the possibility to extend for at least 2 more years, depending on performance and funding availability)
Salary: R$12,700 (about 2400€ per month, tax-free)
To obtain more information about this position, please contact Prof. Carlos Roberto de Souza Filho (beto@unicamp.br).