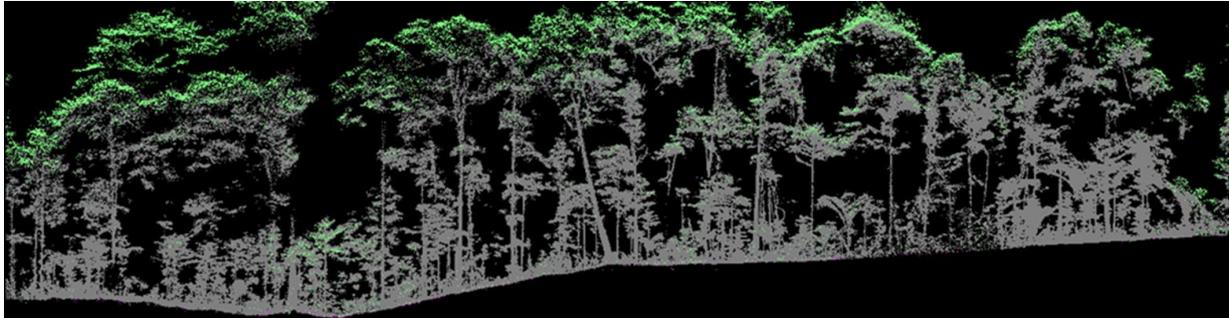**Post-doctoral research fellowship in data analysis and computation science: 3D LiDAR point cloud modelling for forestry applications**

2-year Post-Doctoral Research Fellowship in **data analysis and computation science** at AMAP lab, in Montpellier, France.

Context

We are looking for an enthusiastic post-doctoral research fellow to advance tree centric approaches to resource management of hyper-diverse tropical forest. To this end we plan to develop methods in 3D modelling of aerial laser scanning data.

The post-doc contract is funded by the French government in the framework of the CartoDiv-DendroLidar project (http://amap.cirad.fr/fr/edite_projet.php?projet_id=92) conducted in French Guiana. This project which is also supported by the Centre National d'Etudes Spatiales (CNES) seeks to develop high through-put remote sensing techniques for biodiversity inventory and wood volume estimation.

Job description

The successful applicant will be in charge of developing, testing and implementing algorithms to extract individual tree information from ALS and TLS point clouds.

In particular, she/he will build on a recent comparative study conducted at our lab (yet unpublished) which has identified the most promising algorithms currently published to segment individual tree crowns in ALS point clouds. One important avenue of improvement lies in the combination of spectral information (hyperspectral imagery acquired along with lidar data) with the geometric features extracted from the point cloud.

She/he will also develop and improve algorithms to extract individual tree characteristics from lidar data including Plant Area Index, tree standing volume.

Algorithms will be implemented in the Computree software as well as R language (LidR package) for efficient dissemination.

The team

The successful candidate will work closely with colleagues from the biodiversity group (http://amap.cirad.fr/en/th9.php) and the 3D modelling group (http://amap.cirad.fr/en/th11.php).

Qualifications

We are seeking a post-doctoral researcher (PhD required) in computer science, applied mathematics or statistics with good programming skills (e.g., c, c++, python, R).

He/she should have writing skills proven by a decent publication record.

Basic knowledge in remote sensing techniques would be much appreciated.

Good interpersonal skills required to successfully interact with a multidisciplinary team of co-workers.

Salary conditions

We offer a 2-year contract with IRD (the French Research Institute for Development http://en.ird.fr/ird.fr).
Gross monthly salary is c. 2150 € for candidates less than 2 years after PhD and c. 2500 € for candidates between 2 and 5 years after PhD.

Location
The position is based at UMR AMAP, in Montpellier, France (http://amap.cirad.fr/fr/index.php),

Applicants should submit their CV with publication list and statement of research interest to Gregoire.vincent@ird.fr **before the 1st of May 2018**. The targeted starting date is 1st of June 2018.

Suggested readings

Brell M, Segl K, Guanter L, Bookhagen B. 2017. Hyperspectral and Lidar Intensity Data Fusion: A Framework for the Rigorous Correction of Illumination, Anisotropic Effects, and Cross Calibration. IEEE Transactions on Geoscience and Remote Sensing 55: 2799–2810.

Core Team, 2017. Computree platform. Computree group – GIP Ecofor. http://rdinnovation.onf.fr/computree.

Ferraz A, Saatchi S, Mallet C, Meyer V. 2016. Lidar detection of individual tree size in tropical forests. Remote Sensing of Environment: 318–333.

Roussel, JR and Auty, D (2017). lidR: Airborne LiDAR Data Manipulation and   Visualization for Foresty Applications. R package version 1.2.0. https://CRAN.R-project.org/package=lidR

Valbuena R, Mauro F, Arjonilla FJ, Manzanera JA. 2011. Comparing airborne laser scanning-imagery fusion methods based on geometric accuracy in forested areas. Remote Sensing of Environment 115: 1942–1954.

Vincent G, Antin C, Laurans M, et al. 2017. Mapping plant area index of tropical evergreen forest by airborne laser scanning. A cross-validation study using LAI2200 optical sensor. Remote Sensing of Environment 198: 254–266.