BigData Processing of Lidar Point Cloud using Spark
Research Engineer position

FP7 project IQmulus
IGN – MATIS laboratory
Saint Mandé, France

Context

One of the main research topics of the MATIS lab of the French Mapping Agency (IGN) is focused on the acquisition, management and processing of lidar point clouds acquired using aerial surveys and mobile mapping systems.

This position is funded by the european FP7 project IQmulus (www.iqmulus.eu), subtitled « A High-volume Fusion and Analysis Platform for Geospatial Point Clouds, Coverages and Volumetric Data Sets », which goal is to develop a platform that provides the needed functionalities to integrate latest research results in data processing and visualization to tackle important real-life challenges in geospatial applications. Given the wide choice of different available sensors and the massive amounts of data thus obtained, combined with the intent to provide useful knowledge in an appropriate period of time, the platform thus has to be scalable in processing and storage, and capable of handling the four aspects of variety, volume, velocity and analytics that are commonly associated with the term Big Data. New emerging data acquisition techniques provide fast and efficient means for multidimensional spatial data collection using a combination of ground, air-borne and space-borne sensor platforms. All these systems provide point clouds, often enriched with other sensor data, yielding high volumes of raw data.

Scientific contribution

The spark library released this year new DataFrame and External Data Source APIs. The goal of this position is to design a spark-based library that enables the cloud processing of arbitrary large lidar point clouds efficiently on the cloud using a user-friendly API. This library should enable the user to process point clouds with user defined functions by just specifying the locality of the computation (e.g. : spherical or cylindrical neighborhoods, k-nearest neighbors...) without caring about how the point cloud dataset is distributed across the multiple nodes.

The objective of this position is to design and implement such a point cloud processing library and port existing algorithms and processing workflows to this new framework.

Profile
- Programming proficiency in scala and software engineering skills are mandatory**.**
- Prior knowledge and experience in geospatial library development will definitively be an asset.
- Good English reading and writing skills (French skills are valued but not necessary)

Organization
- Beginning : as soon as possible
- End : October 2016.
- Location : MATIS laboratory, IGN, Saint-Mandé, Paris, France
- Salary : depends on the candidate experience.

Application
Applications must be sent to the contact in a single PDF-format and include :

- a detailed CV with a description of realized projects + publications
- a motivation letter
- 2-3 recommendation letters

Contact

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