



*Computer vision, with specialization in
image-based 3D pose estimation*

The MATIS research group, part of IGN - French Mapping Agency's LaSTIG laboratory, is recruiting a postdoc researcher specialized in the area of the 3D pose estimation of cameras based on image analysis, in order to contribute to the creation of a portable real time geolocation system based on urban street-view image analysis.

Keywords

Computer vision, images based localization, 3D pose estimate, visual characteristics extraction, multi-sensor fusion, scaling up of algorithms.

Mission

Under the supervision of the project manager and in close interaction with the team of researchers and engineers of the MATIS research group (http://recherche.ign.fr/labos/matis/accueilMATIS_en.php) of IGN's research laboratory LaSTIG, the postdoc will consider an image-based localization approach, to contribute to the achievement of a mobile embedded geolocation system, with applications to pedestrian navigation in urban environment.

This mission is meant to push further previous research work done at MATIS concerning 3D pose estimation of vehicles relying on visual characteristic extraction from images at different levels of details (points of interest, semantic visual landmarks). We wish to extend our method to the estimation of 3D pose of a human head in outdoor urban environment. The motions involved are richer and more complex than those for a vehicle, making the task of pose estimating more difficult. Furthermore, since the surrounding environment of a pedestrian is less constrained, it raises the need of pre-filtering acquired data for coherent analysis (errors in motion induced by objects like cars, other pedestrians, etc.). Envisaged research tracks are for example the following:

- Multi-sensor fusion (IMU, GPS, images)
- 3D pose estimation by matching non-geotagged images with geo-referenced images and pose estimation from a set of relative poses.

Work environment

The Laboratory of Science and Technology in Geographic Information (LaSTIG) of the National Institute of Geographical and Forest Information (IGN) is composed of four research groups.

One of them, the MATIS, specializes in the areas of computer vision, photogrammetry, image analysis, 3D modeling and remote sensing. The MATIS totals 35 researchers in these fields.

The IGN is a public institute located in Saint-Mandé, bordering Paris, France, accessible by metro line 1 (Saint-Mandé) or RER A (Vincennes).

Project context

Within the European project Things2Do (call KET ENIAC, aid 120 M€, 2014-2017) which brings together 45 European multidisciplinary partners, industrial as well as academics, around the area of nanotechnologies and their applications, MATIS contributes to the study and the development of a portable and lightweight vision system to help with pedestrian navigation in the city, in partnership with the Commissariat à l'Energie Atomique (CEA).

Desired profile

PhD in the field of computer vision or photogrammetry, with expertise in 3D pose estimation and good skills in software development (work environment C/C++ and linux).

Duration of the contract

12 months + renewable 12 months.

Starting date

March 2017.

Place

IGN, Saint-Mandé (bordering Paris, metro line 1: Saint-Mandé, Bois de Vincennes), FRANCE.

Application

Before February 26, 2017, send an email to the contacts with the following documents in a single PDF file:

- a CV detailed with description of relevant research and projects
- a letter of motivation centered on the position
- 3 letters of recommendation with contact information

Contact

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