



## Research Fellow: call for application

### Perception and localization Integrity for Autonomous Vehicles

#### 1. Context and job description

Autonomous vehicles are showing growing interest in the academic community, cars manufacturers and Tech companies. By autonomous vehicles, it refers to a vehicle that can sense its environment, interprets it without any human interaction and makes safe decisions about a mission to achieve. Different levels of autonomy have been defined by the SAE standard.

Based on its long-time experience in the field of Intelligent Vehicles, the Heudiasyc laboratory (UMR CNRS 7253) based at the Université de Technologie de Compiègne is building today a strategic partnership with Renault within the joint laboratory SIVALab<sup>1</sup> to work on high integrity navigation systems for autonomous vehicles with a focus on perception and localization. The notion of integrity is related to a self-assessment ability by the vehicle itself which should manage confidence indicators on its representation of the perceived environment and on its state.

In that context, the goal of this 2-years (renewable) research fellow position is to advance the state-of-the-art by contributing to the design, development and testing of innovative algorithms in the fields of perception and localization for safe autonomous navigation. More specifically, the challenges on which the applicant will focus are the following:

- Perception sensors (e.g. cameras, 3D lidars), wireless communication devices, GNSS and map technology,
- Multi-sensors data fusion for perception and localization enhancement,
- Machine vision and deep learning for dynamic scene understanding.

Moreover, the candidate will have the opportunity to implement and evaluate the proposed algorithms and schemes on autonomous vehicles facilities funded within the Equipex Robotex. These facilities include two autonomous vehicles based on Renault Zoé cars that are fully controllable by computer, and a private test track called SEVILLE, of 300m length near the innovation Center of UTC.



One of the autonomous vehicles based on Renault Zoé cars and the SEVILLE test track

<sup>1</sup> <http://blog.alliance-renault-nissan.com/node/3533>



## 2. Candidates' profile

Prospective candidates must have a solid background, witnessed by published peer-reviewed work and participated research projects, in one or several of the following research fields: Robotics, estimation, GNSS, artificial vision and machine learning with application to autonomous systems and ITS.

Furthermore, they must possess:

- The ability to manage their own academic research, associated activities and students,
- The ability to contribute ideas for new research projects,
- Excellent communication skills in English, including the ability to write for publication, present research proposals and results, and represent the research group at meetings.
- The candidate should have knowledge in C/C++, ROS and matlab/simulink.

Scientific curiosity, large autonomy and ability to work independently are also expected. A PhD degree in computer science, engineering, applied mathematics (or related fields) is required.

## 3. Conditions

**Place:** Laboratoire Heudiasyc UMR CNRS 7253

Université de Technologie de Compiègne

Compiègne

Web site: [www.hds.utc.fr](http://www.hds.utc.fr)

**Employer:** CNRS

**Duration:** 4 years

**Salary:** ~2500 €/month (after taxes) depending on the experience

**Application:** CV with publications record and motivation letter. Please, provide a link to the documents to download rather than attach them to your application email. The application email must be sent to the contacts provided below.

### Contacts

Vincent Frémont, email: [vincent.fremont@hds.utc.fr](mailto:vincent.fremont@hds.utc.fr)

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