MSc 2 – Internship

Learning and recognizing virtual points of interest to improve smartphone geolocation

KEYWORDS

Positioning • Navigation • Smartphone • Signal Processing • Image Processing • Artificial Intelligence • Pattern Recognition

TOPIC

This internship is part of the LabCom inmob, which is a collaborative research and innovation laboratory dedicated to the mobility of people suffering from disabilities, financed by the French National Research Agency. The internship will be conducted with the support of researchers from the IRSTV CNRS research federation (FR CNRS 2488).

Many smartphone-based applications support the navigation of persons with or without disabilities. They exploit GPS, Wifi, Bluetooth, cell phone, camera and inertial signals to compute geographical coordinates. But their accuracy is still insufficient for the safety of life applications. The estimated routes suffer from drift and positioning errors due to the low quality of the sensors embedded in the smartphone and the surrounding obstacles. It is possible to use beacons to correct these errors. These beacons are Bluetooth tags or other tags from the Internet of Things technology. This requires a specific beacons infrastructure in the city. It is also possible to consider virtual points of interest, such as transitions from outdoors to indoors or climbing/descending stairs to correct the coordinates thanks to related map data and geographical information system content. Whereas this concept is well known, it suffers from a lack of robustness and is not adjusted to the specific needs of persons with disability. This internship aims at addressing this issue and may lead to a 3-year doctoral thesis contract.

WORK PROGRAM

- Read and analyse articles on methods for recognizing pattern displacement from signals and images

- Understand and adopt existing map-matching and pattern recognition codes

- Observe and identify with experiments the virtual points of interest related to the situation of disability.

- Propose and test machine learning methods or deep learning to recognize these points of interest.

APPLICATION information

PROFILE	MSc 2 student in Signal/Image Processing, Robotics, Computer Science or Geomatics Engineering
COMPETENCES	Signal/image processing, statistics competences and artificial intelligence-based techniques. A good sense of physics to interpret the data. Programming in Python, Matlab and knowledge in Android.
WHERE	University Gustave Eiffel • Campus Nantes • FRANCE
SALARY	Internship monthly fee about 550€, Possibility of reimbursement of up to 50% of the public transport pass, A very low cost restaurant sponsored by the university. The internship may lead to scientific publications and be continued with a 3-year PhD contract depending on the performance.
HOW TO APPLY	Send CV and motivation letter to valerie.renaudin@univ-eiffel.fr tel +33 (0)2 40 84 56 47 and myriam.servieres@ec-nantes.fr

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