

Engineer or post-doc - Localisation for railways

Localisation systems are nowadays an essential technological brick in the development of new transport solutions. These solutions ensure the knowledge of the position of a vehicle on a map, of a train on its track, knowledge that is essential in railway signalling systems or for the development of autonomous vehicles.

Location solutions using satellite signals (GNSS) such as GPS or Galileo signals are now embedded in all outdoor solutions. They offer a continuous, absolute position service but suffer from the often constrained propagation conditions encountered in terrestrial transport environments: multipath or signals received after reflection (NLOS) degrade location accuracy, masking degrades availability, etc. These constraints require the development of more complex solutions based on heterogeneous sensor information. Multi-sensor solutions combine different data to improve localisation performance.

Other sources of disturbance include the action of interference that locally and/or temporarily blinds the receiver (jamming), or is capable of luring the system (spoofing).

In this context and to overcome these drawbacks, the work carried out focuses on the development of robust solutions, available and capable of managing multipath and interference to offer performances that meet the needs of land transport. These solutions are aimed in particular at precise railway applications for detecting track changes or cold starts (static localisation) and robustness against spoofing.

These solutions call for fault detection techniques, robust estimation, the use of sensors complementary to GNSS (IMU, odometer...), and may require the use of complementary GNSS techniques (RTK, PPP...)

We are looking for a post-doc or research engineer to reinforce our teams on these subjects, with skills on one or more of the following themes: GNSS, signal processing, multi-sensor fusion, Bayesian estimation, probabilistic tools, artificial intelligence, error modelling, ...

The tasks will be multiple: state of the art, solution development (Matlab or other tool), evaluation in simulation and on real data, writing articles and progress reports.

The work will be carried out in strong collaboration between Uni. Eiffel-LEOST/Railenium/SNCF, in contact with industrial partners in the European context of Europe's Rail.

Type of position: Fixed-term or permanent contract

Level: Master, Engineer or Post-doc; Fluent in written and spoken English.

Location: Villeneuve d'Ascq, France

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