



INTERNSHIP PROPOSAL 2020

Department of Electronic, Optronics and Signal (DEOS)

Location : Toulouse, campus SUPAERO

Supervisors : Gaël PAGES
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INTERNSHIP DESCRIPTION

Domain : Signal processing applied to navigation

Title : **ROBUST NAVIGATION ALGORITHMS BASED ON ULTRA-WIDE BAND SIGNALS**

Integrated to the Electronic, Optronics and Signal (DEOS) Department of ISAE-SUPAERO, you are part of the Navigation team. You participate in the study of functions designed to improve the estimation in position and speed of a navigation system, for indoor navigation applications.

Among the different alternatives for autonomous indoor localization and navigation, ultra-wide band (UWB) ranging is a promising solution to achieve high positioning accuracy. The accuracy of the localization solution mainly depends on the quality of range measurements, the geometry of the network, and the performance of the positioning algorithm.

Within this framework, you will realize the study of the state-of-the-art on the use of the UWB signals for navigation, and on robust navigation algorithms. You will then apply your acquired knowledge in a simulator using simulated and real data.

You will be entrusted with the following missions:

- Improvement of the existing UWB navigation algorithms.
 - Impact of network's geometry on the navigation solution
 - Study on the contribution of dynamic bias in the observation model
 - Add robust navigation features.
- Validation of the algorithms throughout simulations, then with real measurements obtained on a mobile platform in order to prove the efficiency and robustness of the developed algorithms.

Depending on the work done, it will be possible to publish the obtained results in an international conference or journal article.

Duration of the internship: 5 to 6 months

10 % Theoretical Research

50 % Applied Research

40 % Experimental Research

Possibility to go on a Ph.D.:

Yes

No

APPLICANT PROFILE

Knowledge and required level:

Student in last year of engineering school or M2 equivalent

Knowledge of estimation methods (Kalman filters) and navigation algorithms

Good knowledge of Matlab

Rigorous and autonomous

Editorial qualities

Good level in English

Applications should be sent by e-mail to the supervisor.