Control Engineering

Université Polytechnique Hauts-de-France

Name of the hosting institution in France	Université Polytechnique Hauts-de-France
Name of the host laboratory / research team	LAMIH UMR – CNRS 8201 Laboratoire d'Automatique de Mécanique et d'Informatique industrielles et Humaines
Address	LAMIH UMR – CNRS 8201, Université Polytechnique Hauts-de-France, Campus Mont Houy, 59313 VALENCIENNES Cedex 9
Name of the supervisor	Dr. Anh-Tu Nguyen
Function	Associate Professor in Automatic Control
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Phone number	

Internship offer

Topic of the internship (title)	Development and Implementation of Robust Estimation Algorithms for Intelligent Vehicles			
Proposed dates of the internship	Start	02/09/2024	End	20/12/2024

Scientific and academic objectives of the internship:

Ensuring safety and comfort is paramount in the development of advanced driver assistance systems (ADAS) for intelligent vehicles. The effectiveness and stability of vehicle control systems depend significantly on real-time data related to various vehicle states and unknown inputs, such as the sideslip angle and tire-road forces.

Acquiring precise knowledge of these variables enhances feedback control performance and the ability to predict real-time tire-road friction and potential vehicle trajectories, playing a crucial role in improving ADAS control performance. Unfortunately, obtaining accurate information about the vehicle's sideslip angle and tire-road forces in mass-produced vehicles is challenging due to high costs and practical limitations. Hence, it is essential to explore alternative methodologies, such as observation or estimation, to effectively determine these vehicle variables. To address this challenge, the internship aims to develop advanced estimation algorithms, i.e., virtual sensors, for intelligent vehicles, with a focus on their integration and validation on instrumented experimental platforms (Renault Zoé-PRETIL from CRIStAL, SHERPA driving simulator from LAMIH, INSA-LAMIH autonomous vehicle).

Industrial partner

Does the project involve a French industry partner?	No
Name	/
Role of the industrial partner in the internship project	/
Main contact	/
Email	/
Main contact industrial partner's branch in Australia	/
Email	/

Australian partner

Is the internship project proposed in the framework of an existing collaboration with an Australian partner university?	No
Name of the Australian partner institution	/
Lab/department/team involved in the collaboration	/
Main contact in the Australian partner institution	/
Function	/
Email	/
Outside of this ongoing collaboration, will students from other Australian universities be considered by the hosting institution in France?	[Select Yes/No]

Expected profile of applicant

Level of study	Master
Discipline	Systems and Controls
Prerequisite knowledge, qualities and skills	Applicants must have a background in systems and controls, applied mathematics, or a related subject, with a strong theoretical foundation and an interest in Control Engineering/Automatic Control. The candidate must demonstrate a keen interest in engaging in innovative, high-profile research. Some experience using Matlab/Simulink and/or conducting experimental validations in previous projects during their academic training would be appreciated. Fluency in English is required (French is not necessary).

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Formulaire de proposition de stage en France – Nicolas Baudin 2024