



Germany Chapter



ITSS Distinguished Lecture

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Dr. Paul Chauchat

Postdoctoral Researcher at the Department of Electronic,
Optronics and Signal of ISAE-SUPAERO, University of
Toulouse

"Recent Results on Inertial Navigation:
Non-linear Insights and Linear Threats"

Date	17.11.2021
Time	17:00 – 18:00 (CEST)
Location	Online Webinar

[Register Here](#)

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Germany Chapter



ITSS Distinguished Lecture by Dr. Paul Chauchat

“Recent Results on Inertial Navigation:
Non-linear Insights and Linear Threats”

Brief Abstract

Mobile systems need to locate themselves ever more accurately, and in ever more complex situations. To this end, they are endowed with various sensors, the data of which are fused to obtain an estimate of the vehicle's location, either globally (with the GPS for instance), or locally, with respect to its surroundings (with cameras for instance). Inertial measurement units (IMUs) are reliable sensors which have been historically used in the aerospace community, but were costly. As the cost of high-grade IMU decreases, they are becoming more accessible for various applications. In this talk I will present some recent advances in state estimation which have direct consequences on precise inertial navigation. First, we will see how the nonlinear consequences of the use of high-grade inertial sensors, and demonstrates how the nonlinear structure of both filtering and smoothing algorithms may be improved by leveraging the invariant filtering framework. Then we will focus on the problems incurred by the linear solvers that are used at each step of nonlinear smoothing algorithms as a result of having highly precise sensors. To solve these issues, a novel linear least-squares solver will be introduced. These works were carried out in a collaboration between the Center for Robotics of Mines Paristech, and the company Safran.

Brief Bio

Dr. Paul Chauchat received the engineering degree in Applied Mathematics from Ecole CentraleSupélec, Gif-sur-Yvette, France, in 2016, and the Ph.D. degree in Computer Science from Ecole des Mines ParisTech, Paris, France, in 2020. He is currently a Postdoctoral researcher at École nationale supérieure de l'aéronautique et de l'espace (ISAE-SUPAERO), working on robust linear and non-linear state estimation with applications to navigation and remote sensing.