AMPERA + LISHA Panel on Autonomous Vehicles at SECCOM 2022

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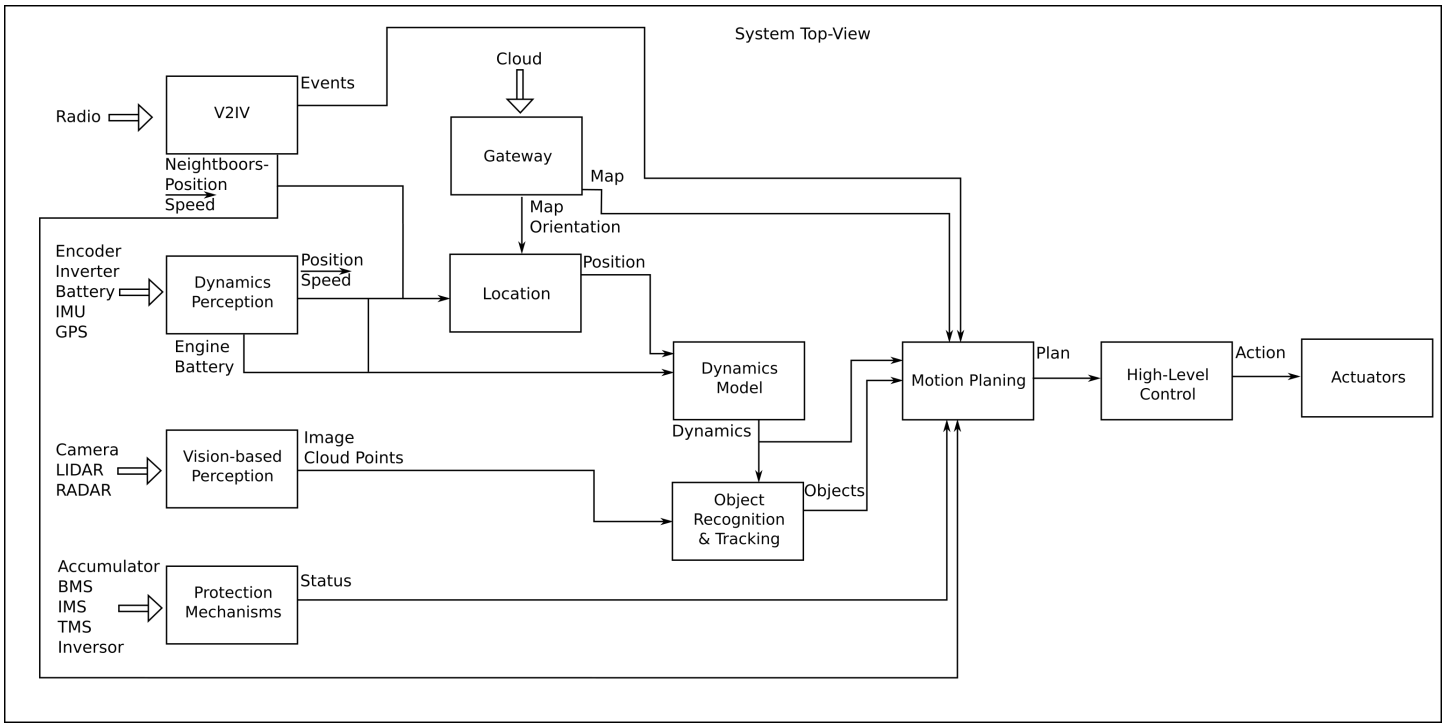
Call for Participation

Date: Nov 30, 2022 Time: 16:00 Place: SECCON / INE / UFSC

Safety as a Data-Centric Design for Autonomous Vehicles

Data is at the core of the design of modern Safety-Critical Systems. Data is no longer only sensed and processed in the context of the control loops of such systems. It is also secured, stored, and transmitted for the sake of the decision-making processes required for higher levels of autonomy. Decomposing the problem domain into a Data-Centric point of view considers the modeling of constructs that will abstract the selected entities and their relationships according to the data they produce and consume, considering timing, safety, security, and persistency. The diagram below presents a top-view of components in Autonomous vehicles.



In this sense, many questions come to the mind when we consider safety in Autonomous vehicles. Some of them are listed below to instigate the discussion in this topic during the panel:

1. Data-Centric design:
    1. How to decompose the Autonomous Vehicles into a Data-Centric Design?
2. Data Trustfulness
    1. How assess trustfulness in ITS?
3. Safety Models
    1. How to ensure safety?
4. Critical components Isolation and Security

1. Which aspects of isolation should be considered for safety and security?
2. Run-Time verification for Intrusion Detection Systems (solutions using Autoencoders and Artificial Immune Systems). How does isolation interfere with the detection of faults, anomalies, and intrusions?

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José Luis Conradi Hoffmann is a PhD student at Federal University of Santa Catarina (UFSC), where he is a member of the Software/Hardware Integration Lab (LISHA) since 2018. He received his M.Sc. degree in Computer Science in 2021, from the UFSC, Brazil. His research interests include Data-Driven Design of Critical Systems, Safety Verification, Formal Methods, Real-Time embedded systems, Machine Learning, IoT, and Security Protocols.

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Antônio Augusto Fröhlich is a Full Professor at the UFSC, where leads the Software/Hardware Integration Lab (LISHA) since 2001. With a Ph.D. in Computer Engineering from TU-Berlin, he has coordinated several R&D projects on embedded systems. Significant contributions from these projects materialized within the Brazilian Digital Television System and IoT technology for Energy Distribution, Smart Cities, and Autonomous Systems. He is a senior member of ACM, IEEE, and SBC.''

Giovani Gracioli is an assistant professor at UFSC and associate researcher of LISHA since 2007. He holds a PhD degree in automation and systems engineering from UFSC. He has participated in several R&D projects in areas such as IoT, safe-critical embedded systems and autonomous vehicles. His research interests include critical embedded software and real-time operating systems.

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