

Embedded Hardware and Software Design of Omnidirectional Autonomous Robotic Platform Suitable for Advanced Driver Assistance Systems Testing with Focus on Modularity and Safety

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Abstract : This paper deals with the problem of using Autonomous Robotic Platforms (ARP) for the ADAS (Advanced Driver Assistance Systems) testing in automotive. There are different possibilities of the testing already in development, and lately, the autonomous robotic platforms are beginning to be used more and more widely. Autonomous Robotic Platform discussed in this paper explores the hardware and software design possibilities related to the field of embedded systems. The paper focuses on its chapters on the introduction of the problem in general; then, it describes the proposed prototype concept and its principles from the embedded HW and SW point of view. It talks about the key features that can be used for the innovation of these platforms (e.g., modularity, omnidirectional movement, common and non-traditional sensors used for localization, synchronization of more platforms and cars together, or safety mechanisms). In the end, the future possible development of the project is discussed as well.

Keywords : advanced driver assistance systems, ADAS, autonomous robotic platform, embedded systems, hardware, localization, modularity, multiple robots synchronization, omnidirectional movement, safety mechanisms, software

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