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AILA - Design of an autonomous mobile dual-arm robot

Jose de Gea

Deutsche Forschungszentrum für Künstliche Intelligenz

ABSTRACT OF THE TALK

This talk presents the design of the robot AILA, a mobile dual-arm robot system developed as a research platform for investigating aspects of the currently booming multidisciplinary area of mobile manipulation. The robot integrates and allows in a single platform to perform research in most of the areas involved in autonomous robotics: navigation, mobile and dual-arm manipulation planning, active compliance and force control strategies, object recognition, scene representation, and semantic perception. AILA has 32 degrees of freedom, including 7-DOF arms, 4-DOF torso, 2-DOF head, and a mobile base equipped with six wheels, each of them with two degrees of freedom. The primary design goal was to achieve a lightweight arm construction with a payload-to-weight ratio greater than one. Besides, an adjustable body should sustain the dual-arm system providing an extended workspace. In addition, mobility is provided by means of a wheel-based mobile base. As a result, AILA's arms can lift 8kg and weigh 5.5kg, thus achieving a payload-to-weight ratio of 1.45. The talk will provide an overview of the design, especially in the mechatronics area, as well as of its realization, the sensors incorporated in the system, and its control software.