



OpenRRArch: una arquitectura abierta, robusta y confiable para el control de robots autónomos [

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text (article)

Analítica

Context: The control and navigation systems of autonomous robots constitute a dynamic field of research in robotics. The possible solutions to problems are often evaluated with laboratory prototypes in order to determine their real performance. We propose in this paper an architecture for the design and development of robotic systems (particularly autonomous multi-robot Systems) that facilitate the work in laboratory due to an open robust and reliable architecture.**Method:** The architecture is supported in open source hardware and software. The operation and communication strategy is characterized by a low consumption of resources, both in processing and communication, and real-time operation. As development platform and Operating System, we used Linux: the communication scheme and the embedded systems run on a 32-bit processor, with a 16-bit instruction set (not ARM, but with Harvard architecture), at 80 MHz (Tensilica Xtensa LX106) for the implementation of the agents. The tools used allow the solution to be both efficient and inexpensive.**Results:** The architecture has been successfully applied in the implementation of a strategy of navigation for a set of small autonomous robots. A set of robots were provided with wireless communication capability, minimum capacity of environmental sensing (obstacle detection) and a navigation algorithm based on population sizes (mimicking the bacterial Quorum Sensing). The system is implemented with great ease, demonstrating both the viability of the navigation strategy and the versatility, robustness and scalability of the OpenRRArch architecture.**Conclusions:** The proposed architecture constitutes a solution for the construction of distributed control systems, in particular multi-agent robotic systems. It enables the rapid, low-cost and high-performance implementation of systems with real-time cooperation and communication capabilities. The architecture allows the integration of agents with different processing capabilities, which

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Baratz Innovación Documental

- Gran Vía, 59 28013 Madrid
- (+34) 91 456 03 60
- informa@baratz.es