ABSTRACT

The X10ABOT Modular, Extensible, Robotics Platform

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We present the architecture and design of a general purpose robotics development kit, called X10ABOT, which aims to facilitate the rapid development of robotic solutions to a wide variety of problems. Robotics kits of this sort are usually aimed at casual hobbyists and children. As a result, these kits usually have severe limitations in the number of sensors and actuators that they can manage. In contrast, X10ABOT is: modular (new functionality can be added through standard daughterboard modules), scalable (up to a maximum of 16 sensors and actuators on each of up to 112 daughterboard modules if implemented on harware with sufficient resources), and extensible (modular software can be added to support new types of sensors and actuators). We have also designed generic ports, capable of handling several types of sensors and actuators. We demonstrate the application of the platform to the development of a general purpose robotics kit, using the Arduino development board. In this implementation, we will show how the system would allow its users to readily add extra sensors and actuators to a project, with minimal configuration, and relatively little impact on the pre-existing user code.

Keywords: Robotics; Modular; Extensible