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COMMON ROBOTICS ARCHITECTURE (CRA)

The IST Common Robotics Architecture (CRA) is being developed in response to the need for rapid robotic application development and prototyping for hardware control systems and data communications. Additionally, the CRA is currently being built to support intelligent robotic applications.

A common problem with many robotics programs is the need for a stable base-line control system on top of which to develop. Without such an API, programmers are relegated to the task of developing custom low-level hardware control code before any additional research such as intelligent navigation and robotic teams, can take place..

The Common Robotics Architecture is being developed to directly address these issues. By creating a “base-line” API of common robotic functions, higher-level developers do not have to deal with the fundamentals of robotics hardware, such as, for example, proper PWM signals, GPS data parsing and communications . Instead, the programmer is able to pull from a library of tested code to quickly implement these systems, and then proceed with their more relevant research.

In addition to the CRA code base, we also define a Common Robotics Architecture

Communications Protocol (CRAcomm) for specific robotics communications. CRAcomm defines a number of specific protocol data units (PDUs) which are relevant to the robotics field. Rather than spend additional effort developing a communications layer, this will be quickly and easily integrated from the base-line CRA package.

CRA and CRAcomm is developed in Java. This gives us many advantages over other languages, however, the most significant is the ability to easily interface with Java-based microcontrollers.

CRA and CRAcomm are both under active development. Alpha versions of both CRA and CRAcomm have been successfully developed and tested with existing robotic platforms at IST.

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