Development of Robot Software Framework PODO: Toward Multi-Processes and Multi-Users

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This paper covers the development of a robot software framework named PODO. The main purpose of PODO is to communicate among multiple processes that generate robotic motions. Each process can generate its own motion or utilize certain variables from other processes, and so we call each individual process a module. Since each of the processes are modularized, the program can be reused and shared with other users. Because the PODO system is designed to operate with multi-processes and multi-users, PODO provides a mediator, Daemon, to avoid confusion or collision arising from multiple output references. Daemon also sends synthesized references to the robot and receives sensor data from the robot. Through the Daemon, users employ abstract data, so don't have to know about the details of the robot. All abstract and common data are shared through the Shared Memory of the Inter Process Communication (IPC) method. PODO also provides real time and non-real time threads to generate motions. We built PODO on the Linux system with Xenomai, and employed it at the last DRC Trials, verifying that each of the modules generated by other persons were reusable and sharable.