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Inter-process communication for robotics applications

Abstract:
Modern robotic systems are developed as a collection of independent processes. For these processes to function together, an inter-process communication system (IPC) must be implemented. Many prebuilt systems are available and this paper presents four popular options (Sockets, ZeroMQ, ACH, and ROS) as candidates for robotics. An analysis is presented for each based on communication latency and design metrics as applied to robotics. An example design is presented with analysis of the IPC selection process.