Digital Twin KR3

KVP Connection

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Tuesday 6th August, 2024

1 Introduction

JOpenShowVar is a versatile, open-source communication interface written in Java, designed to be cross-platform. It facilitates the reading and writing of all variables associated with a controlled manipulator. While it is primarily suited for soft real-time applications, JOpenShowVar offers significant flexibility for researchers. It supports the integration of various input devices and sensors, which can be used to explore and develop novel control methodologies. The library is highly compatible, functioning seamlessly with all Kuka industrial robots that utilize either the KR C4 or KR C2 controllers. This makes JOpenShowVar an invaluable tool for experimentation and innovation in robotic control systems, enabling the implementation of alternative control strategies and the advancement of research in automation and robotics. [1]
KUKAVARPROXY is a robust multi-client server capable of serving up to 10 clients simultaneously. It implements the KUKA CrossComm class, which provides a wide range of functionalities essential for controlling and managing KUKA robots. These functionalities include selecting or canceling specific programs, detecting errors and faults, renaming program files, saving programs, resetting I/O drivers, as well as reading and writing variables. [1]
The communication protocol between KUKAVARPROXY and JOpenShowVar utilizes TCP/IP, specifically through the exchange of specially formatted strings on the TCP/IP layer. KUKAVARPROXY actively listens on TCP port 7000, awaiting connections. Once a connection is established, the server is prepared to handle any read or write requests from the client. This setup allows for efficient and reliable message exchange between KUKAVARPROXY and JOpenShowVar, facilitating seamless communication and control over the robotic systems. [1]

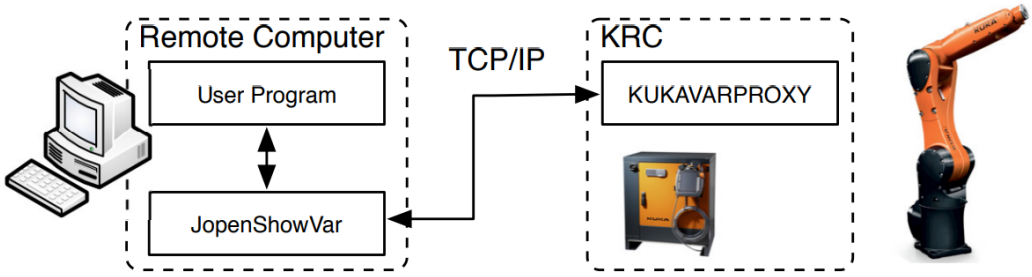

Figure 1: architecture of JOpenShowVar

2 Reading and Writing

2.1 Messages

References

[1] F. Sanfilippo, L. I. Hatledal, H. Zhang, M. Fago, and K. Y. Pettersen, "Controlling kuka industrial robots: Flexible communication interface jopenshowvar," *IEEE robotics & automation magazine*, vol. 22, no. 4, pp. 96–109, 2015.