



## WebBot

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At present, Internet becomes a key of communication in our lives. Along with the World Wide Web (WWW) providing graphical user interface, Internet could enhance teleoperation in an effective and economic manner. An operator needs only a computer and a modem in order to easily control a robot remotely.

The objectives of this research project are as follows:

1. to develop a teleoperation system via the WWW,
2. to design and build a communication scheme between clients and a server, and
3. to design and implement a scheduling system for handling multiple clients.

This project utilizes a server/client architecture to allow an operator to control a 5-DOF robot via the WWW. At the client side, there are two sections which are the A-Z letters section written in Java and the live video feedback section. After a client clicks buttons on the screen, server will receive the corresponding codes representing the chosen characters. The server then computes the X, Y, and Z values of each targeted character. Subsequently, it sends position commands to the robot controller to pick up and place the specified letter blocks. At the same time, a video camera captures and sends live video feedback to the clients. Furthermore, a scheduling system has been implemented in this project for handling a multiple-client access.

Additionally, there is a robot manager written in C++ at the server side for taking care of complexities of kinematics and singularities.

It calculates the robot workspace boundaries and computes joint commands for targeted positions and orientations. These operations are underlying protocols for the users.

Importantly, the concept of this project could be applied for the flexible manufacturing system. Operators can customize, specify, and monitor the details of production remotely and easily. Furthermore, this system also supports multiple network-based machines or multiple clients connections. We are confident that this research project will lead to inventions of the Future.

