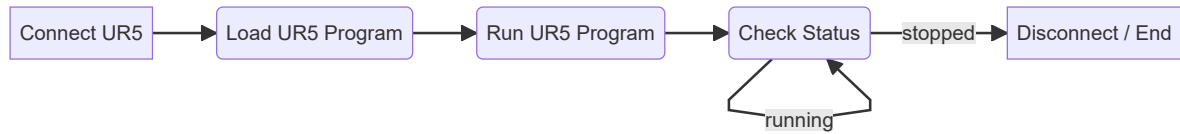


Robot UR5

Workflow



- Connect UR5
 - IP, Port
- Load UR5 Program
- Run UR5 Program
 - Send "Play"
- Check Status
 - Check the status of the robot
 - If stopped, end
 - If running, check again
- End
 - Node end

Plugin Dev(/Source Code)

C++

```
std::string ur5ip1 = "192.168.1.200";
int ur5port1 = 29999;
std::string ur5proj1 = "Accuracy_TEST_HD_Scanner.urp";
int ur5time1 = 0;

WSADATA wsaData;
SOCKET ConnectSocket = INVALID_SOCKET;
struct addrinfo* result = NULL, * ptr = NULL, hints;

// Initialize winsock
int iResult = WSStartup(MAKEWORD(2, 2), &wsaData);
if (iResult != 0) {
    return 1;
}

ZeroMemory(&hints, sizeof(hints));
hints.ai_family = AF_UNSPEC;
hints.ai_socktype = SOCK_STREAM;
hints.ai_protocol = IPPROTO_TCP;
```

```

std::string robot_ip = ur5ip1;
std::string robot_port = std::to_string(ur5port1);
// Resolve the server address and port
iResult = getaddrinfo(robot_ip.c_str(), robot_port.c_str(), &hints, &result);

if (iResult != 0) {
    //std::cout << "getaddrinfo failed: " << iResult << std::endl;
    WSACleanup();
    return 1;
}

// Attempt to connect to the first address returned by the call to
getaddrinfo
ConnectSocket = socket(result->ai_family, result->ai_socktype, result-
>ai_protocol);
iResult = connect(ConnectSocket, result->ai_addr, (int)result->ai_addrlen);
if (iResult == SOCKET_ERROR) {
    closesocket(ConnectSocket);
    ConnectSocket = INVALID_SOCKET;
}

freeaddrinfo(result);

if (ConnectSocket == INVALID_SOCKET) {
    //std::cout << "Unable to connect to server!" << std::endl;
    WSACleanup();
    return 1;
}

const char* sendbuf;
char recvbuf[1024];
int recvbuflen = 1024;

memset(recvbuf, 0, recvbuflen);

// load program
std::string command = "load ";
command += ur5proj1;
command += "\n";
sendbuf = command.c_str();
send(ConnectSocket, sendbuf, (int)strlen(sendbuf), 0);

std::this_thread::sleep_for(std::chrono::milliseconds(100));
int bytesReceived1 = recv(ConnectSocket, recvbuf, recvbuflen - 1, 0);
if (bytesReceived1 > 0) {
    recvbuf[bytesReceived1] = '\0';
    std::cout << "Received ASCII data1 isLoaded?: " << recvbuf << std::endl;
}

// play program
std::string command1 = "play ";
command1 += "\n";
sendbuf = command1.c_str();
send(ConnectSocket, sendbuf, (int)strlen(sendbuf), 0);

std::this_thread::sleep_for(std::chrono::milliseconds(100));

```

```

int bytesReceived2 = recv(ConnectSocket, recvbuf, recvbuflen - 1, 0);
if (bytesReceived2 > 0) {
    recvbuf[bytesReceived2] = '\0';
    std::cout << "Received ASCII data2 isplayed?: " << recvbuf << std::endl;
}

std::this_thread::sleep_for(std::chrono::seconds(1)); // sleep to avoid busy-
waiting

bool checking0 = true;

while (checking0) {
    std::string command3 = "programState";
    command3 += "\n";
    const char* sendbuf = command3.c_str();
    send(ConnectSocket, sendbuf, (int)strlen(sendbuf), 0);
    int bytesReceived = recv(ConnectSocket, recvbuf, recvbuflen - 1, 0);

    if (bytesReceived > 0) {
        recvbuf[bytesReceived] = '\0';
        std::string recvStr(recvbuf);

        if (recvStr.find("PLAYING") != std::string::npos) {
            std::cout << recvbuf << std::endl;
            checking0 = true;
        }
        else {
            std::cout << recvbuf << std::endl;
            checking0 = false;
        }
    }
    else if (bytesReceived == 0) {
        std::cout << "Connection closed." << std::endl;
        checking0 = false;
    }
    else {
        std::cerr << "recv failed: " << WSAGetLastError() << std::endl;
        checking0 = false;
    }

    std::this_thread::sleep_for(std::chrono::seconds(1)); // sleep to avoid
    busy-waiting
}

```

Documentation from Hans Robot

- [UR Robot](#)

Summary

- The plugin is used to control the universal Robot. Inside we defined a workflow, which starts from connecting Robot, loading files, selectting files, checking the status, disconnecting until robot has finished one times job.

