

Project Proposal

Network Controlled Camera Servo

Feb-16/2007

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Project Abstract

The project shows an example of servo motor controlled through Ethernet network. The abstract of the example is to control any servo motor through the internet from the other side of the world. In the particular project, two axis servo is use to control the position of a USB camera attached to a computer showing the currently targeted physical environment image. User can issue commands through network to turn the motors of the servo, so the servo will re-position the camera's target.

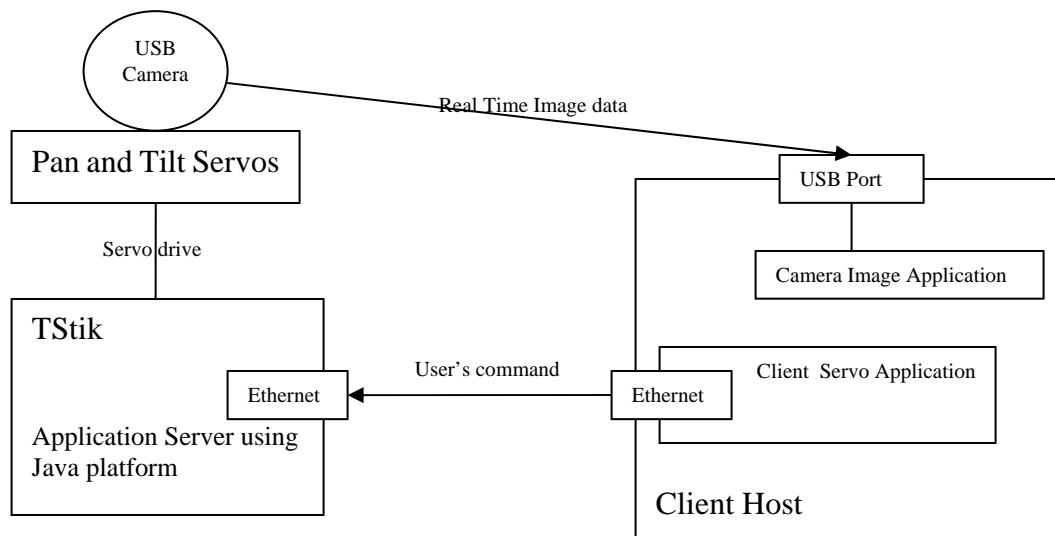
Strategy

The embedded Java platform with TINI400 in the TStik microcontroller development kit from Systronix will be used to control the servo motors. TStik has the built-in Ethernet, so the application user's host can communicate with TStik using Java, as shown in figure 1.

To position the motor, a timer is needed to do this. However, I need to collect further data to determine the position function of time. An http server should be implemented on the TStik, so the client can POST the command to the server, and, GET the current position from the server through a web browser.

The servo to be controlled by the TStik microcontroller is "Pan and Tilt Kit" with a two-motor servo (one for left/right rotation and one for up/down elevation), from robostore.com. The application can be divided into two parts. One part is on the TStik acting as server, listening commands from the network client, implementing and executing the instructions through its output to control the servo; the other part is the Java client installed on the application user's host issuing command to the TStik through the network.

Figure 1



Unknowns

The Java API library will be provided from Systronix, yet the approach to use the API is still unknown. The power needed to drive the servo motor is not determined.

Implementation Plan

First, is to figure out the TStik output port to be used to connect to the servo from TStik. Decide if additional power board is needed to drive the servo, and buy the necessary part for the servo. Based on this configuration, develop the servo driver in the TStik to drive the servo. If additional power board is needed this will create a delay in the servo driver development while ordering the power board. Thus the development for the communication between client and server can be concurrently started while waiting for the power board. The lead time for servo hardware configuration may be two weeks if power board is needed, otherwise one week may be sufficient. The lead time to develop and test the servo driver may take 1 to 2 weeks, the lead time to develop the TStik server may take two weeks, and the lead time for the client may take one week. Thus the entire lead time may take six to eight weeks. All of the components are ordered, and they will arrive within one week.

Resources

The hardware and reference resource for the TStik come in a package from Systronix. Since TStik uses embedded Java, a Java class library reference will be needed. The entire package costs \$209. Besides the hardware development kit, the package also includes the

book “Embedded Ethernet and Internet Complete by Jan Axelson”. Documentation for the Servos is need, and it should be provided by the vendor.