ELE409 SPRING2019 LAB6

Socket Programming and Handwritten Number Recognition

Objectives:

- Use python and C to send information between different devices via socket programming
- Use both UDP and TCP connections
- Learn the basic workflow of client/server (C/S) networking model of machine learning

Pre-Lab:

Make sure you have downloaded the LAB6.zip file from the Sakai website.

Exercise 1: Plot, send and receive on FPGA board

1. On DE1-SoC board, install pygame (run this on board)
   - >> sudo apt-get install python-pygame
2. Move the file "draw.py" in "Files for DE1-SoC/python/" to the DE1-SoC board (run this on the desktop)
   - >> scp draw.py root@131.128.49.xx:Desktop/draw.py

     NOTE: replace "xx" with the true IP address of the FPGA board.
3. Move the file "Server" in "Files for DE1-SoC/c/" to the DE1-SoC board.
4. Open a terminal on board run "draw.py":
   - >> python draw.py
5. Open a terminal on board and run "Server":
   - >> ./Server
6. Unplug the mouse connected with the desktop and plug it into the usb port of the DE1-SoC board.
7. Press the left key of the mouse and move; you will observe a red line drawn. Release the left key, the color of the drawn line changes to black.
8. Press the right key of the mouse to remove all drawn lines
9. Press the middle key of the mouse to send the drawn picture to a remote server, on which running the code " NumberRecongitionServer.py " provided in folder " File for desktop/".
10. Wait for seconds, observe the seven-seg display on DE1-SoC board.

Assignment:

Option 1: Try to run the code "File for desktop/ NumberRecongitionServer.py" on either the lab desktop or your personal computer to replace the role of the remote server provided in Exercise.
Option 2: Modify the provided C files to display received number on a webpage. (hint: use CGI programming you learned in LAB4.)

NOTE: This lab contains challenging assignments that are designed to test students' comprehensive debugging/programming ability. Please try your best to solve it and show what you have learned this semester. Since LAB6 serves as a test purpose, the TA will not provide detailed line-by-line programming instruction.