COMPUTER SCIENCE 280 Introduction to X Window System

UNITS: 3 150 minutes/week of Lecture/Discussion

INSTRUCTOR: Marc Thomas


DESCRIPTION: This course is an introduction to the use of the X graphical environment on Unix-based (or Linux-based) workstations, although we will discuss other display servers (such as Windows NT PC’s). Topics covered will be as follows:


2. Access considerations, discussion of network security, the file .rhosts and the use of rsh and rexec, syntax for hostname, X-server, and screen number ([host]:server.screen), checking the DISPLAY variable and the PATH variable with printenv, The resize command and TERMCAP variable, Running some common clients: xhost, xclock, xterm, dxterm, xcalc, xv, xrn, xedit, netscape, dnotepad, dxsysinfo.


4. More on configuration of xterm, use of xterm with failsafe option of xdm. Manually starting, stopping, and switching window managers. Cutting and pasting with PRIMARY and CUT_BUFFER0 between xclipboard and other X-Clients. Some more X-Clients and further of the Internet: xedit, xarchie, xbiff, xdpinfo, xev, xset, xsetroot, xwininfo. Ascii and binary files and the program ftp.

5. More on events, event types, and event handling. Fonts, formal description, xfontsel, xfd, and font alias files.

6. Display devices, bitplanes, ways for describing colors (RGB, HLS). Icons and bitmaps, images, grabbing screen or window images, more on XLib, examples of graphics programs operating through the XLib.

7. Resources, classes and instances, the full syntax of .Xdefaults and program resource files.

8. Customization of twm with .twmrc and mwm with .mwmrc. Unix processes, fork and exec, comparison with hardwired login, telnet login, and X-login using the chooser, xdm, and XDMCP.

9. Operating system considerations when running X, inittab and runlevels, manually starting X.

10. Security issues and considerations when running X.

GRADING: The course grade will be determined by the Labs (50%) and the Project (50%), which is due on or before the scheduled time of the final exam. There will not be a separate final exam. Projects will fall into one of the following categories (on the next page):
I. Write a C (or C++) program which uses the Xlib. This could be a program which directly makes Xlib calls (lots of work), or uses a toolkit (e.g. the Athena Widgets or Motif toolkit), or a program which uses a graphics package that runs over X (e.g. OpenGL).

II. Write a term paper (of at least 8 pages) which compares the X Window System with a proprietary windowing system (such as Microsoft Windows or MACintōsh finder). Your discussion should include, but not be limited to, market cost, software support, ease of configuration and maintenance, customizability, reliability and robustness, and the third-party market. You will be graded on how well you justify and support your conclusions.

III. Go to web pages http://www.x.org (which is currently providing stewardship of the X Window System) and http://www.opengroup.org which is an industry consortium and which facilitates the operations of x.org, and try to figure out what direction the X Window System is likely to take in the future. You may also want to consult http://www.xfree86.org which is an honorary member of x.org and which provides X Window System support to Linux.

IV. If you don’t like the preceding types of project, you may propose a different one with the consent of the instructor.

REGARDLESS of the type of project that you choose, I want a one-page cover sheet consisting of a description of your project. If you have written or ported some software, I need to know where the relevant files are. If you have found any bugs you should report these also.