CSCI-3753: Operating Systems
Spring 2020

Anh Nguyen
Department of Computer Science
University of Colorado Boulder
Who is this TA???

• CS Ph.D. student
• Email: Anh.TL.Nguyen@Colorado.EDU
• Work in Mobile & Network Systems Lab (MNS)
• Research area: mobile healthcare
• Lead project: sleep improvement system
Like sleeping?

We are looking for healthy individuals who are enthusiastic about sleeping!

You may be eligible for a sleep study to test a new device that monitors brain waves during sleep. **After the study, you will learn about your sleep quality assessed by our licensed expert.**

The study will take place at the **CU Boulder Engineering Center, room ECAE 103** and will last about 4 hours.

You will be reimbursed a $25 check.

Scan the QR code or email **sleep.aid.studies@gmail.com** to apply
Welcome to Operating Systems Recitation

• Office hours:
  • T/F 08:30AM – 10:00AM

• Location: ECCE 1B12

• Available other times as needed, send me an email to schedule

• Attendance might be taken at the TA's discretion.

http://mnslab.org/anhnguyen/courses/S20_3753_Rec.html
Goals

• Lectures
  • Concepts
  • General issues

• Recitation
  • OS-specific concepts and examples
    • Linux environment
    • Detailed explanation of key algorithms, topics, etc. in lectures
Grading Policy

• Recitation Quizzes
  • Content?
    • Lectures taught & corresponding book chapters within the week
  • Time?
    • The last 10 minutes of the class
  • Method?
    • Online on Moodle → Bring your LAPTOP !!!
    • Open book
    • Moodle enrollment key: CU-OS
• Grading?
  • 10% of the final grade
Grading Policy

• Programming Assignment
  • 4-5 assignments
  • Interview-style grading
    • 20-40% working code
    • 60-80% interview
  • The extra credit for early submission is 10% of the grade that you get.

\[
\text{min}(100, \text{actual grade} * 1.1)
\]

Highly encourage you to submit running programs that have partially completed functionality for partial credit !!!
Week 1: OS & Environment Setup
What is an Operating System?
5 Main Managers Developed in an OS

- App 1
- App 2
- App N

- Process Manager
- File System Manager
- Device Manager

- “Kernel” OS
- Networking

- Host 1
- Host 2

- CPU
- Memory
- Disk
- I/O
- Flash drive
- NIC
Get Ready for Your Environment

• Download CU CS Virtual Machine.
  • [https://foundation.cs.colorado.edu/vm/](https://foundation.cs.colorado.edu/vm/)
  • Two download options (HTTP and Torrent)

• Download and install VMware hypervisor
  • Player/Workstation/Fusion.
  • You should have a CU VMware webstore account.
  • If not, contact [help@cs.colorado.edu](mailto:help@cs.colorado.edu)

• Import CU CS VM to VMware
Loading an OS using GRUB

• What is GRUB?
  • A bootstrap loader
  • Provide configuration options to boot from a list of different kernels available on the machine

GNU GRUB  version 1.98-1ubuntu5

Ubuntu, with Linux 2.6.32-22-generic
Ubuntu, with Linux 2.6.32-22-generic (recovery mode)
Ubuntu, with Linux 2.6.32-21-generic
Ubuntu, with Linux 2.6.32-21-generic (recovery mode)
Memory test (memtest86+)
Memory test (memtest86+, serial console 115200)

Use the ↑ and ↓ keys to select which entry is highlighted. Press enter to boot the selected OS, 'e' to edit the commands before booting or 'c' for a command-line.
Configuring the Grub

• Step 1: From the command line, load the grub configuration file:

```bash
sudo emacs /etc/default/grub
```

• Step 2: Make the following changes to the configuration file:
  1. Comment out (#):

```bash
GRUB_HIDDEN_TIMEOUT=0
GRUB_HIDDEN_TIMEOUT_QUIET=true
GRUB_CMDLINE_LINUX_DEFAULT="quiet splash"
```
Configuring the Grub

• Step 2: Make the following changes to the configuration file:
  2. Add:
     
     `GRUB_CMDLINE_LINUX_DEFAULT=""`
  3. Save updates

• Step 3: From the command line, update Grub:
  
  `sudo update-grub`

• Step 4: Reboot your virtual machine and verify you see a boot menu.
Preparations for PA1

• The assignment will be released soon.

• Goals
  • Compile a kernel
  • Add your own System Calls into the OS
    • What is a system call?
    • Examples: open(), close(), read(), write(), wait(), exec(), fork(), exit(), kill()
  • Snapshots function in VMware
Week 1 – Checklist

- Self-enroll on Moodle
- Have VMware setup ready
- Have CU CS Virtual Machine Fall 2018 Ed. Installed
- Read more about system calls