Welcome!

COMS 4118
Operating Systems I
Fall 2020
Teaching staff

• 5 Teaching Assistants (TAs)
  – Hans Jr Montero hjm2133@columbia.edu – Head TA
  – Lucie le Blanc ll3163@barnard.edu
  – Dave Dirnfeld dd2912@columbia.edu
  – Kent John Hall kjh2166@columbia.edu
  – Evan T Mesterhazy etm2131@columbia.edu

• TA email & office hours
  – Emails to cucs4118-tas@googlegroups.com go to all teaching staff

• Instructor: Jae Woo Lee
  – Email: jae@cs.columbia.edu
  – Office: 715 CEPSR
Who am I?

• Jae Woo Lee
  – Senior Lecturer in Computer Science
    • Teaching first, research second
  – Just call me Jae (pronounced ‘Jay’)
    • Note that this is NOT a general rule – address instructors as Professors unless told otherwise

• My background
  – Undergrad in Columbia College
  – Many years of professional experience
    • Designing and coding large-scale software systems
    • Running a start-up company
  – Came back to Columbia for Ph.D.

• I’m not an OS researcher
  – Interested in possibly joining OS research group?
  – Then take OS with Prof. Jason Nieh
Prerequisites

1. PLEASE PLEASE DO NOT TAKE THIS COURSE IF YOU DON’T KNOW C COLD

2. UNIX
   – Must be comfortable at command line
   – Don’t take the course if you never worked on UNIX

3. Computer architecture
   – Basic knowledge of computer hardware: register, cache, bus, etc.
   – Should be able to read simple assembly code: load, store, add, jmp, etc.

4. Data structures
   – Nothing fancy, but must be solid on the basics: list, tree, stack & queue

Columbia courses:
For 1 & 2:
   W3157 Advanced Programming
For 3:
   W3827 Fundamentals of Computer Systems
For 4:
   W3134, W3136, or W3137 Data Structures
Exam dates

• Two **ONLINE** but **SYNCHRONOUS** exams
  – **Wed 10/28, 4:10pm**: Midterm exam
  – **Wed 12/23, 4:10pm**: Final exam
    • Sorry, this is the time slot assigned by the registrar 😞

• There are **no make-up and no alternate exams**
  – Please take OS next semester if the exam times do not work for you

• Your overall grade
  – HW 40%, Midterm 30%, Final 30%
  – Grading policy may change later
Mode of instruction

• Lectures
  – All online – zoom links on CourseWorks
  – All lectures will be recorded
    • Please do not login too early
• Possible in-person recitations
  – Would qualify this course as hybrid for international students who must take this course as in-person
  – Will poll the class later
Office hours

• Jae’s office hours
  – All online
    • Zoom link posted on my cal right before it starts
  – In-person meetings generally not available
    • Even for those who are in NYC (for equity reasons)
    • But will make exceptions for those in need

• TA office hours
  – All online
Topics

• General OS theory
  – Throughout the whole semester

• Advanced UNIX programming
  – First 1/3 of the semester
  – UNIX from outside
    • Processes, threads, networking, concurrency, signals, non-blocking & async I/O

• Linux kernel implementation
  – Later 2/3 of the semester
  – UNIX from inside
    • Syscalls, wait queues, scheduler, file systems, virtual memory
15 million lines of code

• “As of 2013, the Linux 3.10 release had 15,803,499 lines of code”
  – Learn to navigate a large code base
  – Learn to read code rather than documentations that are often vague, out-of-date, or flat-out wrong

• You are likely to encounter a large existing code base at work
Homework

• 7 assignments (not including hw0)
  – Some are individual, some are group assignments
  – Some are short & light, some are long & heavy
  – Assignments carry different weights

• Some assignments may not be graded
  – But you won’t know until after the deadline
  – HWs picked for grading will be 40% of your grade

• Late policy
  – 20% penalty after deadline up to 24 hours; zero afterwards
Zero tolerance on cheating

• REQUIRED READING: http://www.cs.columbia.edu/~jae/honesty.html

• You are cheating if you:
  – Take code from friends, or search for code on the Internet
  – Look at solutions that your friend has from previous semester
  – Upload any class materials (including your own code) to public repository (ex. GitHub) during or after this semester

• We can tell
  – We compare you submissions to CURRENT AND PREVIOUS submissions
  – You submit work history – minimum 5 commits required
Textbooks

1. **Operating Systems: Three Easy Pieces**
   - Version 1.00, 2018 – by Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau

2. **Linux Kernel Development**

3. **Advanced Programming in the UNIX Environment**

4. **And a few other online materials that will be assigned**

Get them wherever you usually get your textbooks from...
Class ListServ

• Communication between all of us, including official announcements
  – Do:
    • Ask & answer questions – 1st place to go for non-personal questions
    • Provide helpful tips & links for your classmates
    • Be considerate & friendly
  – Don’t:
    • Ask questions without first trying to solve it on your own
    • Post code or critical info that leads directly to solution
    • Be impatient & rude
  – Learn to manage high volume
    • [ANN] in email subject for announcements – set up Gmail filter

• Please use class listserv rather than TA mailing list
  – General questions to the TAs may be redirected to class listserv with your ID removed
  – Never send a same question individually to multiple TAs

• There will be an ongoing anonymous feedback form
Let’s get to work

1. **Subscribe to 4118 ListServ TODAY**
   - In the textbox “Your name (optional)” put Your Full Name (UNI)
     - For example: Jae Woo Lee (jwl3)
   - You must reply to the confirm email (which might be in your spam folder)
   - Then receive “Welcome to the "Cs4118" mailing list”
     - This email contains your password for accessing archives of past postings

2. **Read the following two documents:**

3. **HW0 (50 points) – due Fri, 9/11, 11:59pm**
4. **HW1 (100 points) – due Sun, 9/20, 11:59pm**
5. **Reading assignments**
   - See course home page for HW0, HW1, and reading assignments: [http://www.cs.columbia.edu/~jae/4118/?asof=20200908](http://www.cs.columbia.edu/~jae/4118/?asof=20200908)

6. **Start forming groups of 3 – feel free to advertise on listserv**