CS 5204
Operating Systems
Fall 2007

Godmar Back

About Me

• Undergraduate Work at Humboldt and Technical University Berlin
• PhD University of Utah
• Postdoctoral Work at Stanford University
• Joined Virginia Tech as Assistant Professor August 2004
• Research Interests:
  – Operating systems, runtime systems and compilers: focus on building reliable systems.

Course Facts

• Meet TR 2:00pm-3:15pm McBryde 216
• Will use class website as primary means of communication
  – http://courses.cs.vt.edu/~cs5204/fall07-gback
• Will use Blackboard Portal for grades
  – http://learn.vt.edu
• Will add forum
  – http://forum.cs.vt.edu/

Prerequisite/Force-Add

• I expect that everybody who is interested in taking this class will be able to do so
• Send email to gback@cs.vt.edu with your name and student id if you are not yet officially enrolled

Email Etiquette

• Please make sure your From: line has your full name
• Picture shows how to enter it in vt’s webmail

About This Class

• Graduate Level Operating Systems
  – Emphasis on preparing students for research
    • Read and evaluate research papers
    • Learn from experienced researchers
    • Learn OS by studying systems
  – Projects
    • Unstructured problems
    • Presentations (2)
      • Of others’ research and your own
Reading Material

- Assigned research papers are primary reading
- Textbooks for background include
  - Silberschatz, Galvin, Gagne: Operating Systems Concepts
  - Nutt: Operating Systems
  - Stallings: Operating Systems Internal and Design Principles
  - Tanenbaum: Modern Operating Systems
  - Tanenbaum & van Steen: Distributed Systems: Principles and Paradigms

Format

- Discussions + lecture
- Paper evaluations
- Speaker evaluations
- Two student presentations
  - one for assigned research paper
  - one for term project
- Structured projects
- (Unstructured, open ended) term project

Discussions

- Everybody reads assigned papers before class
- Submit brief evaluation form
  - Proves you’ve read the paper
  - Enables you to contribute to discussion
- Instructions on how to submit will be on website

Late Policy

- No late submissions will be accepted.
- Instead, you have six wildcards:
  - Six dates on which you can skip evaluations without penalty
  - Need not be announced beforehand
- Contact instructor for exceptions in severe circumstances only
- Unlikely to grant incompletes (I)

Paper Evaluation Form

- What problem does the paper attack? How does it relate to and improve upon previous work in its domain?
- What are the key contributions of the paper?
- Briefly describe how the paper’s experimental methodology supports the paper’s conclusions.
- Write down one question you plan to bring up in the discussion.

Your Presentation

- 2 parts
  - First, present research as if it were your own
    - Giving background if necessary
  - Then, change roles:
    - Evaluate research from your perspective: add insights, criticism, etc.
- Help lead subsequent discussion
Preparing Your Presentation

• Guidelines for presentations are posted on class website
  – Strongly recommend you read them
• Every student must meet with instructor to discuss slides.
  – It’s your responsibility to schedule a suitable time, early enough such that there’s still time for revisions to your slides
  – You must have your slides ready by that time.

Getting Feedback

• Speaker evaluation forms
• TA compiles forms and provides summaries
• You do this as a courtesy to your fellow students who benefit from your feedback

Speaker Evaluation Form

• Content
  – Did the speaker extract and emphasize the paper’s main contributions?
  – Did the speaker put the presented work in context?
• Form
  – Slides: Were the slides readable and concise?
  – Presentation: Was the presentation understandable and clear?
  – Other comments you wish to provide, if any

Class Participation

• Important
• Usually proportional to preparation
• Will give you feedback
  – Insufficient
  – Sufficient
  – Above average

Midterms

• Probably 2 midterms
• Midterm dates to be announced
• Covers material from lectures and discussion

Term Project

• Two Choices:
  – Survey Paper
  – Programming Project
• Milestones
  – Project proposal
  – Will post schedule
• Final Presentation
  – To teaching staff during or before final’s week
  – open to entire class (and interested parties)
Survey Paper

- Done individually
- Explore research area or controversy
- Do not merely summarize n papers
- Rather
  - Identify problems, ideas and concepts in related (or contrasting) research and approaches
  - Learn and discuss trade-offs
  - Evaluate approaches

Survey Topics: Examples

- OS Support for Multi-core architectures
  - Including Cell
- Threads vs. Events
- Soft Updates vs. Journaling File Systems
- Virtualization Techniques
- Multi-tasking/resource control in a JVM
- Techniques for reliability in OS
- … pick your own topic of interest here

Programming Project

- Done in teams of 1-2 students (3 only if project size warrants) – like to see 2 students as the norm
- Many options:
  - Build small distributed system
  - E.g., small P2P system; distributed web cache
  - Distribute existing system
  - Perform experiments
  - E.g., characterize Linux workloads; try CFS
  - Modify or improve existing system
  - E.g., add Superfetch to Linux
  - … your own idea

Grading

- 30% Midterm(s)
- 10% Paper Evaluations + Class Participation
- 10% Research Paper Presentation
- 40% Projects
- 10% Final Presentation
- These may be subject to change

Honor Code

- Will be strictly enforced in this class
- Do not cheat
  - Observe collaboration policy outlined in syllabus
- Do not plagiarize
  - Use proper documentation (see separate notes)
  - Also applies when preparing presentations
  - Also applies to project documentation/reports
- Read the policies posted on the website
  - Note reference to “codes of ethics used by professional societies in the United States”
- If in doubt, ask!