Operating Systems

Welcome and Q&A Session 1 – 21.01.2021

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The lecture mode for now

- Flipped classroom (or “inverted classroom”) – what’s that?
  - Idea: Enable students to “attend" lectures whenever they have time
  - Usually, the lecture times are instead replaced by group work sessions
    - That’s a bit difficult to do online…
  - Weekly sessions (Thu 12:15-13:00) on zoom
    - Discussion of general Q&A on contents, logistics etc.
    - Discussion of solutions to exercises handed in
    - Hints for and overview of new exercises for the week

Course information

- Main source of information on the web: http://folk.ntnu.no/michaeng/tdt4186_21/
  - Syllabus, lecture slides, exercise sheets, video links, …
- Youtube lecture videos
  - Linked from web page
- Blackboard course
  - Submission of exercises
  - Announcements
- Piazza discussion forum
  - https://piazza.com/class/kjsdvlsw6fx51p

Exercises / Assessments

- Theoretical exercises: ***recommended***
  - Six theoretical exercise sheets
  - Corrected and commented on, but not part of the grade
- Practical exercises: ***mandatory***
  - Five practical exercises
  - Subsequent exercises are based on earlier ones
  - Practical exercises make up 50% of the overall grade
  - Each practical exercise is worth 1/5th (20%) of this
- Submit solutions ***in groups*** (2 or preferably 3 students)
  - Find group partners on piazza, enter in Blackboard (yes, that's not ideal… but I didn't want to force groups)
- Submission dates of theoretical and practical exercises *overlap!* Theoretical exercises serve as preparation for the practical part

Overview of practical exercises

- Practical exercises
  - Handouts starting this week
  - Two weeks time to submission
  - We are going to explore Unix/Linux from the system call interface

Week	Publication date	Handin date	Topic	PDF	Code
3	21.01.2021	04.02.2021	Practical C exercises		
5	04.02.2021	18.02.2021	Process synchronization		
7	18.02.2021	04.03.2021	Thread synchronization		
9	04.03.2021	18.03.2021	Deadlocks		
11	18.03.2021	15.04.2021	Memory		

Grading

- Letter-based grading is back! (Hooray?)
- Two parts:
  - Practical exercises (50%)
  - Home exam (This probably won't change) (50%)

- The exam will be based on the lecture contents, theoretical and practical exercises
  - We will publish an example exam with typical questions
  - In addition, we will publish a sample solution for self assessment
  - Of course, we will also have a Q&A session for this

Teaching assistants

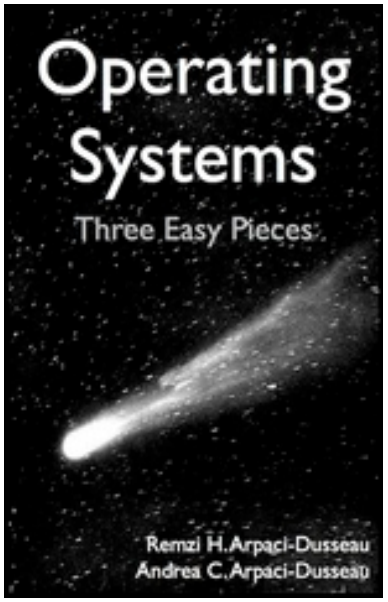
- Alexander Fredheim
- Ruben Sevaldson
- Scott Gullaksen
- Sindre Stephansen
- Viktor Solberg

Semester overview

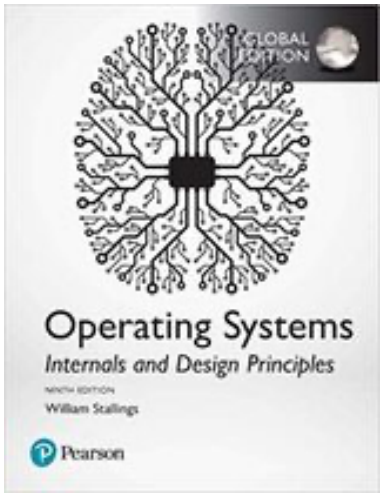
- Review of relevant computer architecture concepts
- Challenges and tasks of operating systems
- Control flow abstractions: processes and threads
- Concurrency: mutual exclusion, synchronisation, deadlocks
- Memory management and virtual memory
- Scheduling: uni- and multiprocessor, realtime
- I/O management and disk scheduling
- File management
- Virtual machines and microkernels
- The Cloud, Unikernels and single-address space OS's
- Embedded systems and non-functional properties
- Operating system security

Literature

Authors	Remzi H. Arpaci-Dusseau and Andrea C. Arpaci-Dusseau
Title	Operating Systems: Three Easy Pieces
Available	Free PDF download: http://pages.cs.wisc.edu/~remzi/OSTEP/



Author	William Stallings
Title	Operating Systems - Internals and Design Principles, 9th Global Edition
ISBN	9781292214290



+ additional papers, articles, … on my web page: http://folk.ntnu.no/michaeng/tdt4186_21/