

Advanced Operating Systems

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Chapter 0: Introduction



What is it about?

Major goals:

- 1 Hands-on experience with working in the area of operating systems research
 - 2 Practical insights in the design and implementation of real operating systems
 - 3 Build on top of a state of the art, formally verified Microkernel
- Modeled after course of the same title by Gernot Heiser / Kevin Elphinstone at University of New South Wales (UNSW), Sydney (<http://www.cse.unsw.edu.au/~cs9242/>)
 - ▶ lecture slides from UNSW
 - ▶ use seL4 microkernel as lowlevel infrastructure
 - ▶ build OS services on top
 - ▶ study various seminal publications along the way

Practical work

- Implement a simple operating system (SOS) on top of a microkernel
 - ▶ 10 Milestones from UNSW:
 - M0 Familiarisation
 - M1 Timer driver
 - M2 Memory Manager
 - M3 Pager
 - M4 System call interface
 - M5 Implement filesystem
 - M6 Demand paging
 - M7 Process Management
 - M8 ELF loading
 - M9 Documentation and final system

Resources

- Main website (No password required):

`http://www.cs.hs-rm.de/~kaiser/2020_aos.php`

- Git repository (need a cs account)
 - ▶ seL4 source (adapted for ODOID C2)
 - ▶ AOS project template
- AOS Wiki (need a cs account) → read it and feed it!
- Hardware: one ODRIOD C2 Kit for each group
- ~~Use in Lab or~~ To take home

Formalities ...

- Practical work and technical discussion (“Praktische Tätigkeit und Fachgespräch“) → register now
- You will get marks for:
 - ▶ reaching milestones
 - ▶ your documentation
 - ▶ writing wiki articles
 - ▶ technical discussion (“Fachgespräch“) at end

Outlook: What to do next winter?

- in WS 2020/2021
- Technical Seminar (“Fachseminar“) on Advanced Operating System topics
- write scientific paper
- to be presented at a semi-real workshop:

WAMOS 2021

5th Wiesbaden Workshop on Advanced Microkernel Operating Systems

- see CfP at : www.cs.hs-rm.de/~kaiser/events/wamos21
- Management via easychair.org
- You will be a member of the program committee