

Advanced Operating Systems

Robert Kaiser

HTTP: <http://www.cs.hs-rm.de/~kaiser>

E-Mail: robert.kaiser@hs-rm.de

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Chapter 0: Introduction



What is it about?

Two 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
- 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
 - ▶ learn to write peer reviews

... but not just a clone!



- different hardware platforms: Wandboard, BeagleBone Black
- additional materials from TU Dresden
- write scientific paper
- to be presented at a semi-real workshop:

WAMOS 2017

3rd Wiesbaden Workshop on
Advanced Microkernel Operating Systems

- see CfP at : www.cs.hs-rm.de/~kaiser/wamos3_cfp.php
- Management via easychair.org
- You will be a member of the program committee

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/1717_aos.php`
- Git repository (need a cs account)
 - ▶ seL4 source (adapted for Wandboard)
 - ▶ Fiasco.OC source (adapted for Raspberry Pi)
 - ▶ U-boot source (ditto)
 - ▶ (OKL4 V3.0 source)
- AOS Wiki (need a cs account) → read it and feed it!
- Hardware: one Wandboard, BeagleBone or SabreLite kit for each group

Formalities ...



- “Praktische Tätigkeit und Fachgespräch“ → register now
- You will get marks for:
 - ▶ reaching milestones
 - ▶ your paper
 - ▶ your presentation
 - ▶ writing wiki articles