

# Advanced Operating Systems

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

WAMOS 2015

2nd Wiesbaden Workshop on  
Advanced Microkernel Operating Systems

- see CfP at : [www.cs.hs-rm.de/~kaiser/wamos\\_cfp.php](http://www.cs.hs-rm.de/~kaiser/wamos_cfp.php)
- Management via [easychair.org](http://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/1515\_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 Raspberry Pi, Wandboard, BeagleBone or SabreLite kit for each group

# Formalities ...

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