

# Advanced Operating Systems

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WS 13/14

# 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 an L4 family 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!

- use Raspberry Pi as hardware platform
- additional materials from TU Dresden
- use their Fiasco.OC microkernel instead of seL4
- also write scientific paper
- to be presented at a semi-real workshop:

WAMOS 2014

1st 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:
    - 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/1314\_aos.php`

- Git repository (need a cs account)
  - ▶ 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 kit for each group

# Formalities ...

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