## **Advanced Operating Systems**

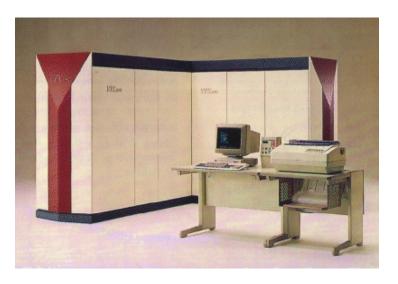
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# Chapter 0: Introduction





#### What is it about?



### Two major goals:

- Hands-on experience with working in the area of operating systems research
- 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



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### ... 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
- Management via easychair.org
- You will be a member of the program commitee



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### Practical work



- Implement a simple operating system (SOS) on top of a microkernel
  - 10 Milestones from UNSW:
    - Familiarisation
    - Timer driver
    - Memory Manager
    - Pager
    - System call interface
    - Implement filesystem
    - Demand paging
    - Process Management
    - El E loading
      - ELF loading
      - Documentation and final system

### Resources



Main website (No password required):

- 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 ...



- ullet "Praktische Tätigkeit und Fachgespräch" o register  $\underline{now}$
- You will get marks for:
  - reaching milestones
  - your paper
  - your presentation
  - writing wiki articles