Advanced Operating Systems
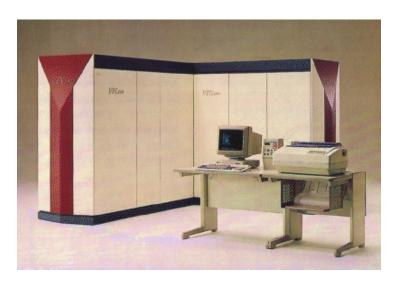
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What is it about?

Hochschule **RheinMain**

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
  - ▶ 8 Milestones from UNSW:
    - M0 Familiarisation
    - M1 Timer driver
    - M2 System call interface
    - M3 Virtual Memory Manager
    - M4 Implement filesystem
    - M5 Demand paging
    - M6 Process Management
    - M7 Documentation and final system

Resources

- Main website (No password required):

    http://www.cs.hs-rm.de/~kaiser/2121_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~~ student
- ~~Use in Lab or~~ To take home

Formalities ...

- Practical work and technical discussion
  ("Praktische Tätigkeit und Fachgespräch") → register <u>now</u>
  Also need signed form "Antritt zur Prüfung in einer
  Lehrveranstaltung" ASAP
- You will get marks for:
  - ▶ reaching milestones
  - ▶ your documentation
  - ▶ writing wiki articles
  - ▶ technical discussion ("Fachgespräch") at end

Outlook: What to do next winter?

Hochschule **RheinMain**

- in WS 2021/2022
- 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 commitee