TI III: Operating Systems & Computer Networks Organization

Prof. Dr.-Ing. Jochen H. Schiller

Computer Systems & Telematics

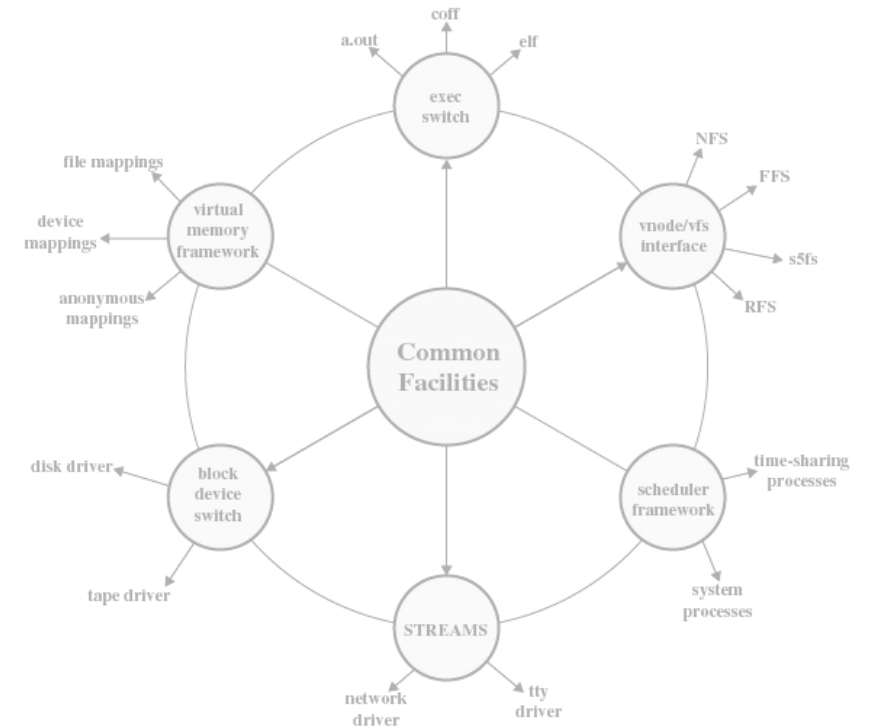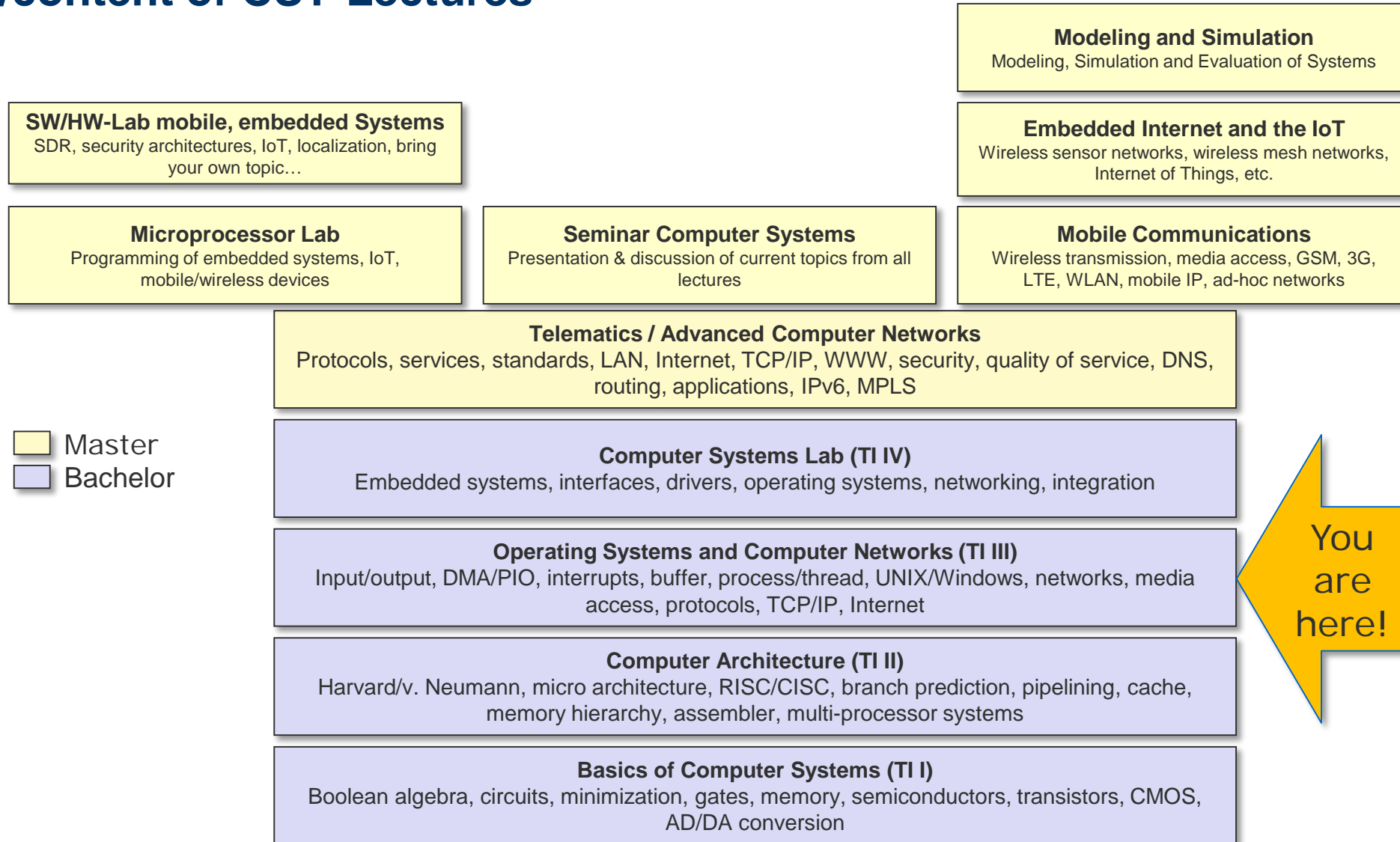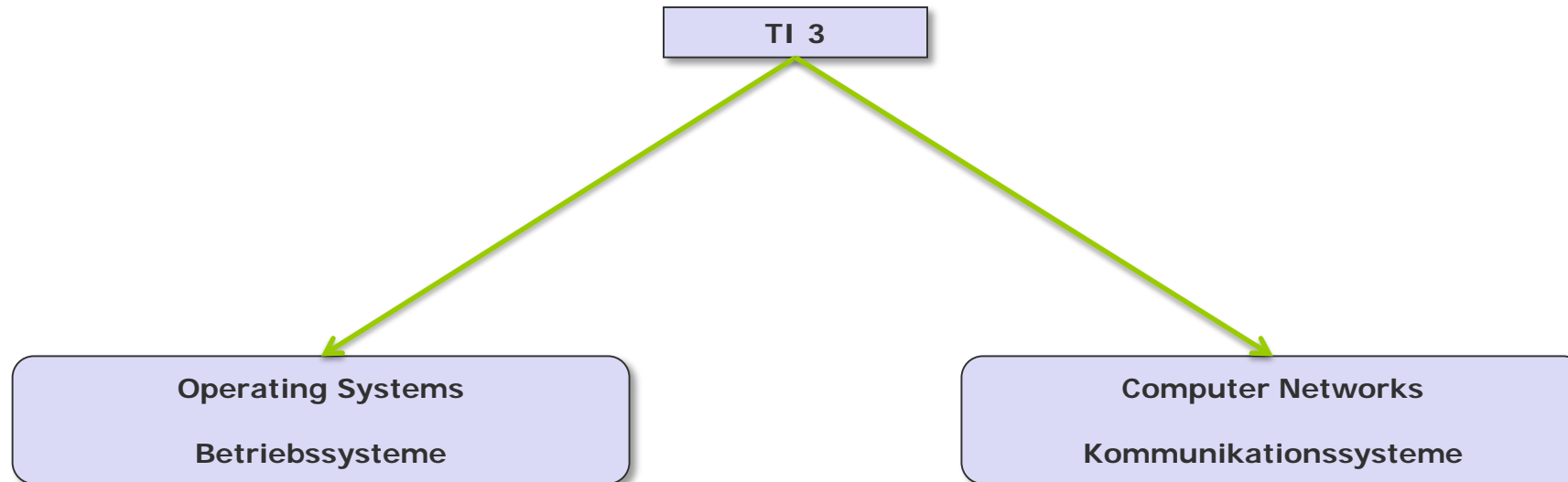**Freie Universität Berlin, Germany**

Figure 2.16 Modern UNIX Kernel [VAHA96]

Structure/content of CST-Lectures

Modeling and Simulation
Modeling, Simulation and Evaluation of Systems

SW/HW-Lab mobile, embedded Systems
SDR, security architectures, IoT, localization, bring your own topic…

Embedded Internet and the IoT
Wireless sensor networks, wireless mesh networks, Internet of Things, etc.

Microprocessor Lab
Programming of embedded systems, IoT, mobile/wireless devices

Seminar Computer Systems
Presentation & discussion of current topics from all lectures

Mobile Communications
Wireless transmission, media access, GSM, 3G, LTE, WLAN, mobile IP, ad-hoc networks

Telematics / Advanced Computer Networks
Protocols, services, standards, LAN, Internet, TCP/IP, WWW, security, quality of service, DNS, routing, applications, IPv6, MPLS

Master
Bachelor

Computer Systems Lab (TI IV)
Embedded systems, interfaces, drivers, operating systems, networking, integration

Operating Systems and Computer Networks (TI III)
Input/output, DMA/PIO, interrupts, buffer, process/thread, UNIX/Windows, networks, media access, protocols, TCP/IP, Internet

You are here!

Computer Architecture (TI II)
Harvard/v. Neumann, micro architecture, RISC/CISC, branch prediction, pipelining, cache, memory hierarchy, assembler, multi-processor systems

Basics of Computer Systems (TI I)
Boolean algebra, circuits, minimization, gates, memory, semiconductors, transistors, CMOS, AD/DA conversion

Content

```
                              ┌──────────────┐
                              │     TI 3     │
                              └──────────────┘
                             ╱                ╲
                            ╱                  ╲
           ┌────────────────────┐      ┌────────────────────────┐
           │  Operating Systems │      │   Computer Networks    │
           │                    │      │                        │
           │   Betriebssysteme  │      │ Kommunikationssysteme  │
           └────────────────────┘      └────────────────────────┘
```

Content

Content

Content

➢ Programming in C as part of the exercises

Course Organization

Everything virtual via Webex meetings/events!

General:

Lecture
- Available online
- Flipped-classroom: Q&A, discussions, Friday, 10-12h, via Webex (invitations see KVV)

Office Hours
- Jochen Schiller: Tue 14:00-15:00, https://fu-berlin.webex.com/meet/jochen.schiller or via email
- Tutors: during tutorials

News and Updates
- KVV course site (via announcements)

Tutorials
- Groups of approx. 25-30 students
- Time depends on group
- Registration via KVV

Assignments:

New assignments each week
- Available in KVV

Discussion
- During the tutorials

Practical assignments
- @home, should work on all platforms
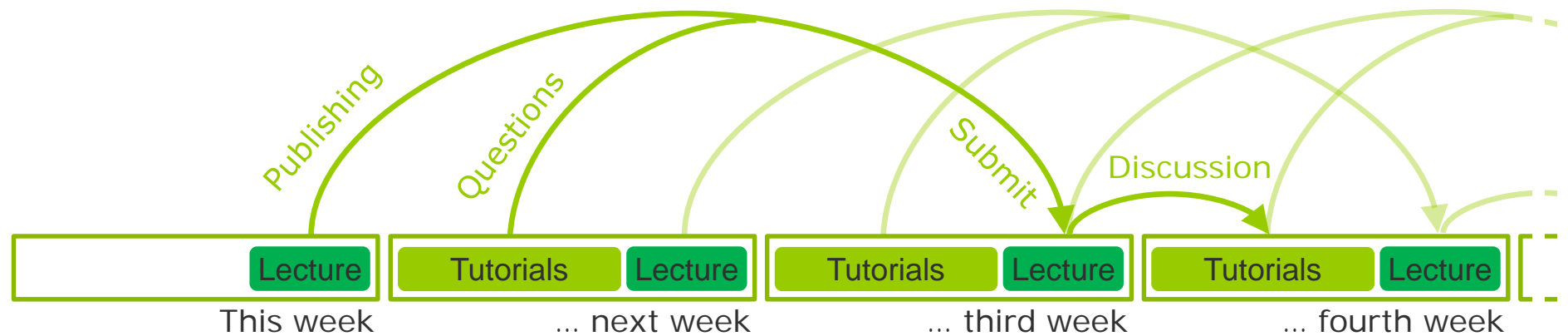- More during Q&A/tutorials

Handing in
- ➤ *Right on time!*
- Complete electronic workflow!
- Solutions handed in too late will be ignored!

Assignments

Übungsblätter: Available on Fridays in KVV after Q&A

Submission: Two weeks later until start of class (Fri, **10:15**)

Discussion: Three weeks later in tutorials

Criteria for Successful Participation

Active participation in the tutorials is essential!
- Minimum n-2 times present

Hand in your assignments on time
- Teamwork is required with 2 students per team

Successful submission of at least n-2 assignments

Each student with a correct answer must be able to present the assignment during the tutorials
- At least one presentation during the tutorials

At least 50% of the max. number of points in the exam are required

Only the exam counts for grading!

Exam: to be announced

Literature

Archive of the lectures! – see KVV for links

- Prepare yourself! Follow the lecture BEFORE Q&A
- Prepare a list of questions & discuss during Q&A

The course is based on:

- William Stallings, Operating Systems: Internals and Design Principles, Prentice Hall International
- Larry L. Peterson, Bruce S. Davie, Computernetze – Eine systemorientierte Einführung, dpunkt Verlag

Additional literature:

- Andrew S. Tanenbaum, Modern Operating Systems, Prentice Hall
- Abraham Silberschatz, Peter B. Galvin, Greg Gagne, Operating System Concepts, John Wiley & Sons

RIOT-OS

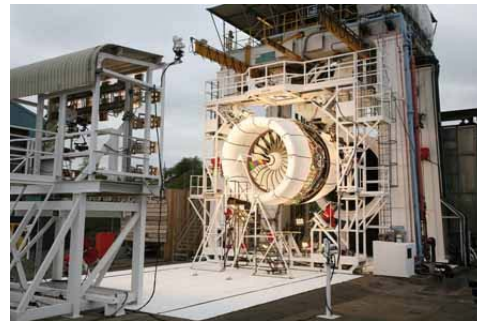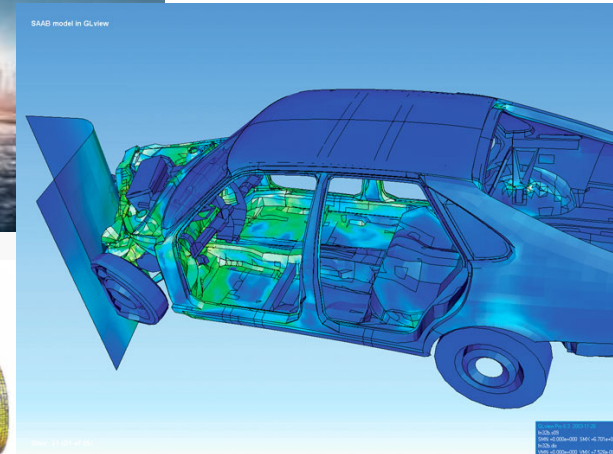The friendly Operating System for the Internet of Things.

http://riot-os.org/

OS-support for HPC (Grids)
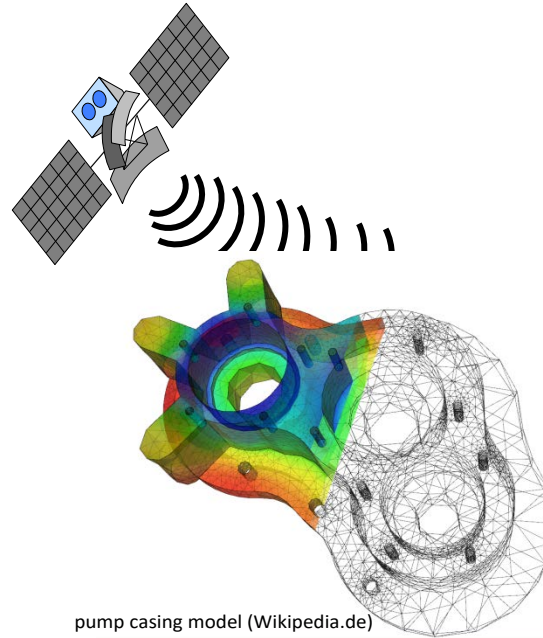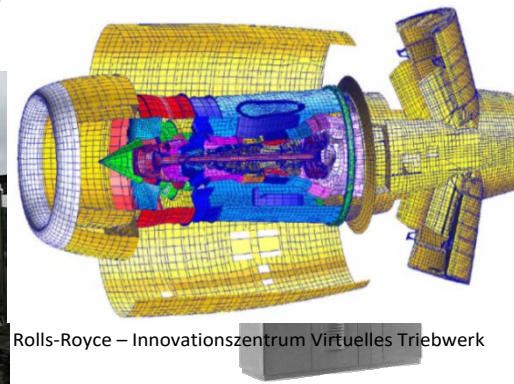

pump casing model (Wikipedia.de)

Mercedes-Benz

SAAB model in GLview

Saab (Wikipedia.de)

Rolls-Royce – Innovationszentrum Virtuelles Triebwerk