Computer Networks

Introduction

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https://teaching.dahahm.de

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Agenda

- About me and this lecture
- Organizational
- Computer Networks

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Interaction in this Lecture

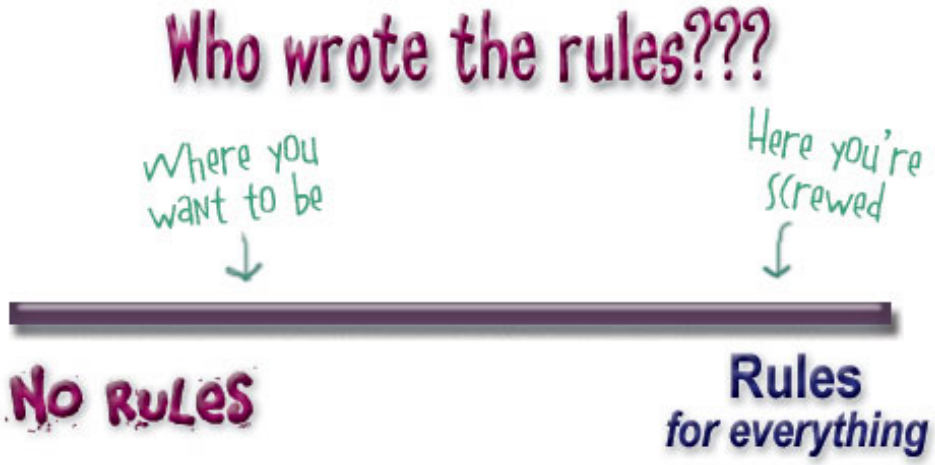
- Participate lively
- Ask questions!
- A key attribute for science is scepticism

Source: public domain

"Education is a dialogue not a one way monologue" [1]

[1] JNICSR Times, http://jnicsrtimes.com/?p=1476

Some Rules



Source: headrush.typepad.com

Rules for this Course

- Be respectful
- There are no stupid questions or comments
- You can interrupt me at any point
- The lecture starts on time (soft real-time)

About me

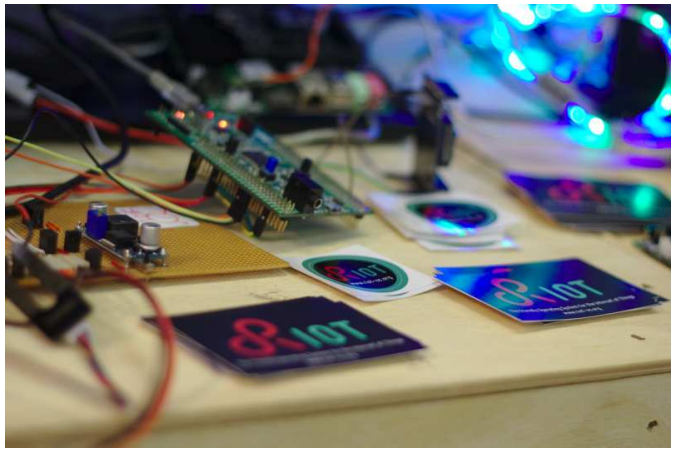
- Study of Computer Science at Freie Universität Berlin
- Software Developer for ScatterWeb and Zühlke Engineering
- Research on IoT and Operating Systems

Contact

E-mail: oliver.hahm@fb2.fra-uas.de
Office hours: Fridays 10:00 – 11:00, room 1-212

Join the RIOT!

RIOT is the friendly operating system for the IoT!



You're interested in ...

- ... programming the IoT?
- ... collaborate with hundreds of people from all over the world?
- ... contribute to a big FLOSS project?

Get in touch

Get in touch and do some hacking at the *All RIOT* event at the university!
Every two or three weeks 4pm in room 1-237.

Or look at `https://riot-os.org/community.html`

What about you?

Please go to the survey at
`https://pingo.coactum.de/137261`

What about you?

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- Which part of your studies do you find most interesting?

What about you?

Please go to the survey at
`https://pingo.coactum.de/137261`

- Which part of your studies do you find most interesting?
- What is your favorite network application?

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Organizational

- Lecture: Friday 11:45 – 13:15, room 4-109/110
- Exercises
  - Friday 14:15 – 15:45, room 1-237
  - Friday 16:00 – 17:00, room 1-237
- Written exam

campUAS

Enrolment Key:
`HahmCompNet`

Organizational

- Lecture: Friday 11:45 – 13:15, room 4-109/110
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Please note!

- There is no registration for the exercises, but the room size is limited!
- First come, first serve!
- There is a dedicated lecture and exercise for students of Mobile Applications

Further Information

Course page

All material regarding this course can be found at `https://teaching.dahahm.de`.

This includes

- Announcements
- Slides
- Exercises

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Do not ask!

Everything is relevant for the exam.

Slides

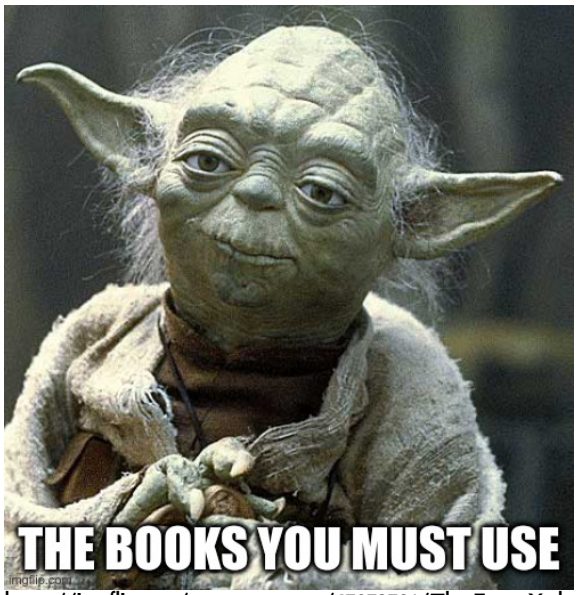
- The creation of the slide sets is work in progress
- They cover all topics of the lecture
- **BUT** they are no book and, hence, do not comprise
  - all details
  - all derivations
  - all thoughts and discussions which are part of the lecture and exercises

⇒ participate

⇒ ask questions

⇒ take notes

⇒ do your own research (e.g., use the books)

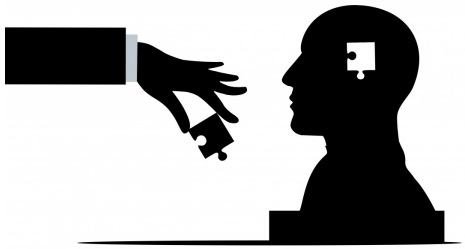


https://imgflip.com/memegenerator/47973781/The-Force-Yoda

Exercises

The exercises are no legal precondition for participating in the exam, **BUT** they...

- ...are very important to recap the content.
- ...are a good opportunity to check your understanding.
- ...provide the chance to ask me all your questions.



Exam

What is necessary to pass the exam?

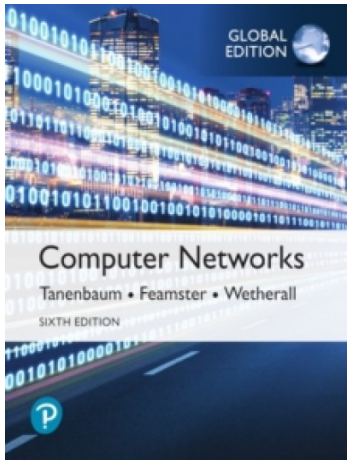
You should be able to ...

- explain main concepts and ideas with your own words,
- select a suitable solution for a given problem,
- analyze a given solution and detect (potential) problems, and
- explain your answers.

Literature

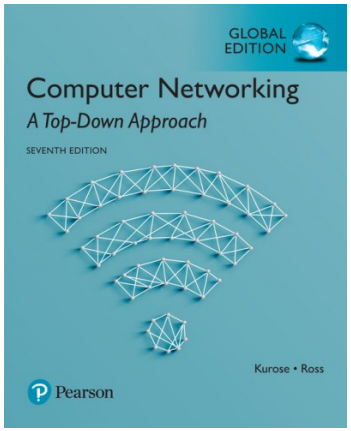
- Andrew Tanenbaum, David Wetherall: *"Computer Networks"*, 6th Ed., Pearson, 2021.

  `https://elibrary.pearson.de/book/view/99.150005/9781292374017?`



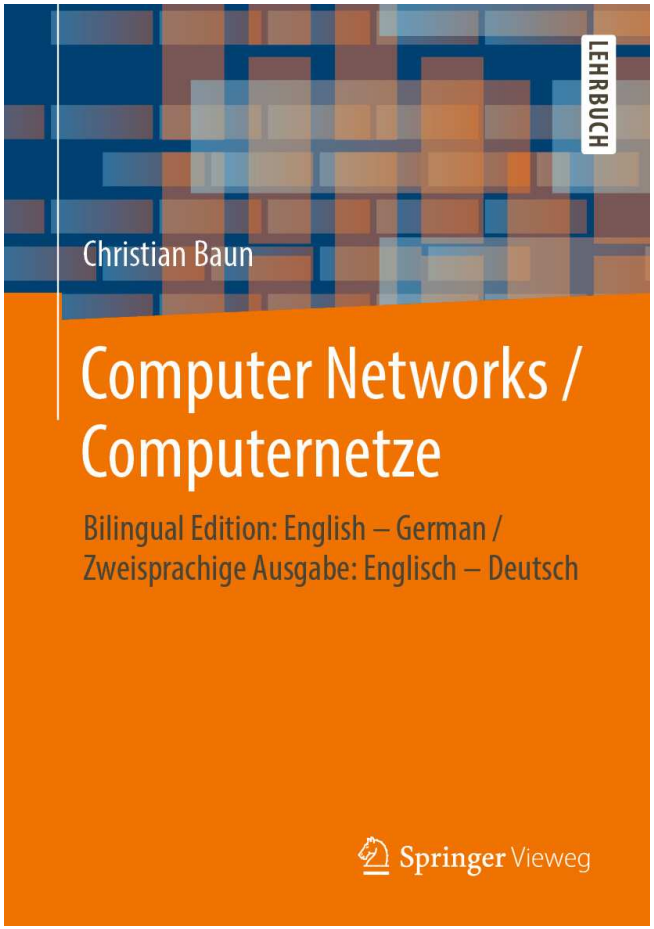
- James F. Kurose, Keith Ross: *"Computer Networking"*, 7th Ed., Pearson, 2016.

  `https://elibrary.pearson.de/book/view/99.150005/9781292153605?`



You can borrow both of these books from the library or access them online for free (see links above).

More Literature



- Parts of the slide sets are closely related to the books.
- The two-column layout (English/German) of the bilingual book is quite useful for this course

Digital versions of these books can also be found at the library to be downloaded online for free.

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The Relevance of Computer Networks

What are applications for computer networks?

The Relevance of Computer Networks

- Video streaming
- Online gaming
- Instance messengers
- Video conferences ($\rightarrow$ home office)
- Mobile communication
- Smart home ($\rightarrow$ IoT)
- Car infotainment

Author: Senado Federal

https://bit.ly/3jB5yRe

https://bit.ly/3EgpLnq

[2] License: https://creativecommons.org/licenses/by/2.0/deed.en

The Relevance of Computer Networks

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The most popular network?

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https://bit.ly/3EgpLnq

The most popular network?

The Internet

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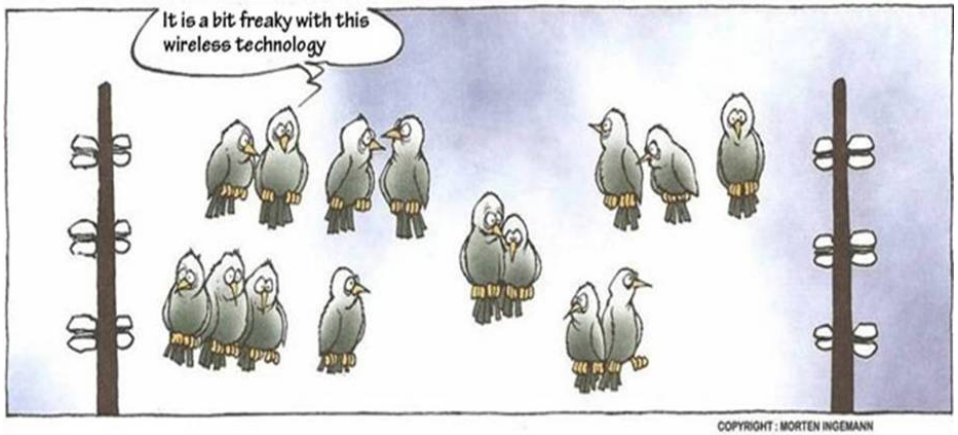
Related questions


https://bit.ly/3Cfu2Xw

- How do you access videos on YouTube?
- What's the deal with a *lag* in online gaming?
- Who can read my mails?
- How can we transmit data through the air (aka wireless networking)?



Objective

At the end of this course, you should . . .

- understand what the term *"online"* means,
- be able to explain what the *Internet* is,
- know how computers communicate,
- know what protocols are,
- be familiar with the layers of a network stack,
- understand how the data finds its way, and
- be conscious of security and privacy concerns of computer networks.

Motivation

- Your motivation

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  - Good case: curiosity and willingness to learn

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Motivation

- Your motivation
  - Good case: curiosity and willingness to learn
  - Best case: already interested in Computer Networks
  - Pass the exam
- My motivation
  - Like to teach
  - Computer Networks are of utter importance (and super interesting)
  - Prepare you for your job

Summary

- At the end of each chapter the last slide summarizes the most important take-away messages
- Now is a good moment to recapitulate whether there are any open questions
- When preparing for the exam these summaries can help you