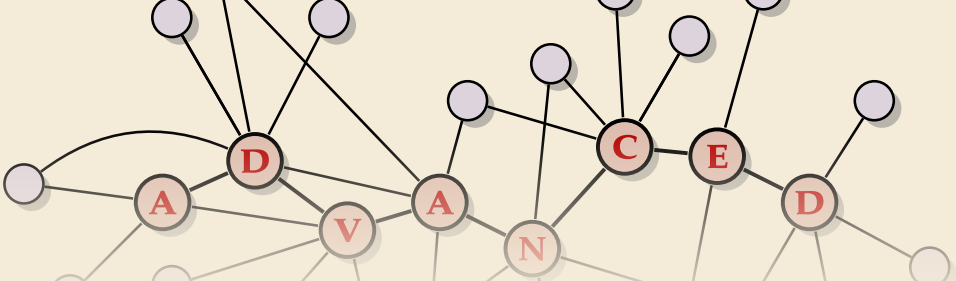

0 Administrativa

22 April 2025

Prof. Dr. Sebastian Wild

CS627 (Summer 2025)
Philipps-Universität Marburg
version 2025-04-22 09:46

Goals for Today

- give you some detail on **what** this module covers
- ⇝ so that you can decide whether to keep it

  if it is an elective module for you

Advanced Algorithms

- inform you about **how** AdvAlg is run
- inform you about how AdvAlg is **assessed**

Welcome to CS 627 – Advanced Algorithms

- Dozent: Prof. Dr. Sebastian Wild
  Mehrzweckgebäude, Raum 05 D 16
  wild@informatik.uni-marburg.de

  Tutor: Mohammed Omer Omerm@students.uni-marburg.de

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- Module website: www.wild-inter.net/teaching/advalg
  → your first address for any infos on ~~CS 566~~

- *Campuswire:* collaborative Q&A (more on this later)
  also used for announcements
  → please register via link from the ILIAS announcement
  https://campuswire.com/p/G8A144D4D PIN 9631

- *Slido:* student response system for formative feedback → bring a smart device to class!

- Final mark: 100% final exam
  Admission to exam: 50% of points from exercise sheets & mini-seminar

Audience Response System: *Slido*

- Goal: Collect immediate, formative feedback
  - Stay focused and engaged! ("active learning")
  - Quick feedback (for you individually) if you are on track.
  - Quick feedback (for me) whether (most of) you are on track.

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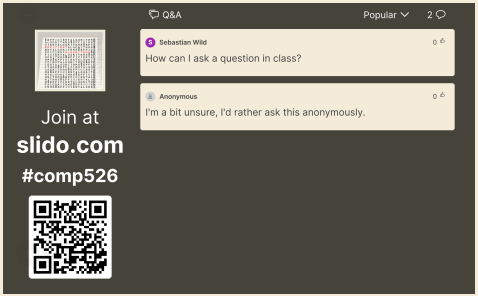
- Slido has 2 useful features:

1. Quick Polls

2. Audience Questions



My approach to lectures

My conclusions (from years of own experience, a pandemic, and observing others)

irrespective of the mode of delivery!

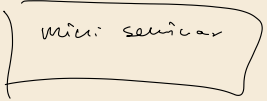
0. Good explanations (intuitions!) and well-structure material are the most important aspect.

1. **Synchronous (live) lectures** beat videos in keeping up with class. (but recordings are great!)

2. Only a small minority of students asks questions in class. ⇝ other backchannels

3. **Interaction** makes content memorable (and keeps brains awake!) ⇝ *Slido* tasks

Components of EA



Slido questions

immediate feedback
simple questions

Lectures

new material
discussions
big picture

Tutorials

get practice solving problems
solve deep questions

Campuswire

collaborative Q&A knowledge base

Exam Question Gallery

collaborative pool of potential and past exam problems

Final Exam

summative assessment
of your acquired skills

Assessments

- **Module mark** = mark in final exam
- **Final exam**
  - written or oral examination
- **Exam Material:** everything covered in lectures (except marked "$\notin$ exam")
  everything covered in **tutorials** and exercise sheets
- **Admission requirements to final exam**
  - ≤ 2 exercise sheets with 0 points in your group
    (not handing in implies 0 points)
  - $\geq 50\%$ of available points in sum over all exercise sheets
  - successful participation in NP-completeness mini-seminar

stay tuned ...

NP-Completeness Mini-Seminar

- **Goals**
  - Refresh NP-hardness and reductions
  - Work with primary literature
  - Practice writing and presenting formal proofs

NP-Completeness Mini-Seminar

- **Goals**
  - Refresh NP-hardness and reductions
  - Work with primary literature
  - Practice writing and presenting formal proofs
- **Deliverables**
  1. Written formal proof with full details
     Must include two worked examples of the reduction (one Yes-instance, one No-instance)
  2. Video presentation explaining your problem and the reduction
  3. 3 short peer-review reports about other groups' submissions
- **Organization**
  - During weeks 2 and 3
  - Groups of 3–5 students
  - On reductions from Richard Karp's original 21 NP-hard problems

1972

Tutorials

- *Exercise Sheet* (Übungsblatt)
  - released on module website
  - to be **handed in**
    - handin on ILIAS
    - in **groups** of 3–4 students
  - practice problems
  - enhancement problems
- in *tutorials*
  - discussion of selected solutions

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  - practice problems
  - enhancement problems
- in *tutorials*
  - discussion of selected solutions
- **Marking**
  - Mainly for your feedback
  - Serious attempts will yield partial credit even if unsuccessful

*Use the tutorials to **practice** your thinking!* = Don't cheat yourself!

"If I tell you to run 10km, it isn't because I want you to be 10km away from me."

Generative AI

We live in exciting times!

LLMs (ChatGPT, DeepSeek etc.),
Media (Midjourney etc.), GitHub CoPilot, ...

- Generative Artificial Intelligence (GenAI) is amazing!
  - full of flaws (hallucination, bias, copyright, data privacy, cost, ...)
  - and yet ... often helpful, surprisingly versatile
- Why not use for everything?
  - Need for *deeply skilled* humans here to stay (for now anyways)
  - ⇝ **Skill comes from practice!** (We still teach mental arithmetic in primary school!)

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assessments designed for upskilling *humans*

⇝ For our assessments: *Don't take away the **thinking**! = Don't cheat yourself!*

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Acceptable use:

- preparatory research (≈ Wikipedia)
- proof reading (spelling, grammar)

Unacceptable use: (not exhaustive!)

- use generated parts w/o acknowledgment & citation
- tools to paraphrase others' work to pass as own
- generated parts with inappropriate prompt, e. g., "write me a conclusion for this essay"

Clicker Question

What do you think is the **#1 predictor** of whether a student cheats in assessments?

→ *sli.do/cs627*

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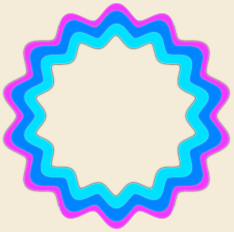
Source: youtu.be/sMpC8QwWSbI

→ *sli.do/cs627*

What is Campuswire?

Campuswire is an online space for lectures

1. ***Class Feed:*** questions on material
2. ***Chatrooms:*** structured social space
   similar to Slack or Discord



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Use in brower
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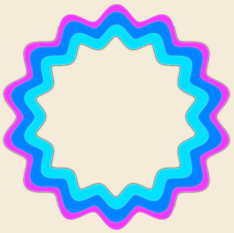

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We use Class Feed for **collaborative Q&A**

- Ask *public* questions
  - *"Why is* $\lg(n^3) = \Theta(\log n)$*?"*
  - *"Will there be classes on public holidays?"*
- ***Answer*** **your peers' questions!**
  - Know the answer? → put it in!
  - Know a partial answer? → Post it, others can build on it!
  - Found a helpful answer (or question)? → Vote it up!
- Ask *private* questions
  - if your question might contain "spoilers" for assessments
  - if you feel the answer is only relevant for you personally

How to Campuswire

- Our goals for Campuswire Q&A:
  1. **be fair** Same answers for everyone
  2. **learning by teaching** *You* should answer most questions (collectively)!
  3. **be inclusive** posts can be anonymous; you can take your time to ask and answer

How to Campuswire

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  2. **learning by teaching** *You* should answer most questions (collectively)!
  3. **be inclusive** posts can be anonymous; you can take your time to ask and answer

- Therefore, we instructors will
  - redirect you to Class Feed for questions,
  - wait before answering, to give other students a chance to answer first,
  - explicitly mark good answers (and questions!) as such

ILIAS

- Official announcements
- Hand-in of exercise sheets
- Announcement of marks

. . . what can be on the public module website goes to the public module website!

Exam Question Gallery

- We jointly collect a **pool of exemplary exam questions**.
- ***You*** *add* ***your*** *questions to it.*
- I will give feedback which questions are realistic.
- *. . . and we will pick one if there's sufficiently many good ones!*

⇝ great resource for exam preparation

⇝ We will answer selected questions in recap session (last week of classes)

- Engage in this early and pose great questions