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0 Administrativa

31 January 2022

Sebastian Wild

Welcome to COMP 526 – Applied Algorithms

▶ Instructor: Dr. <u>Sebastian</u> Wild
  Ashton Building 223
  `wild@`liverpool.ac.uk

  Tutorials: Ben Smith
  `b.m.smith@`liverpool.ac.uk

▶ Module website: www.wild-inter.net/teaching/comp526
  → your first address for any infos on COMP 526
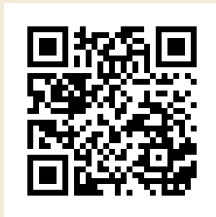
▶ *Campuswire:* collaborative Q&A (more on this later)
  also used for announcements
  → please register via link from the Canvas announcement
  https://campuswire.com/p/G89660827   PIN 0758

▶ *Slido:* student response system for formative feedback
  please bring your smartphone, laptop, etc. to class

▶ Final mark: 50% final exam + 50% assessments (more later)

Clicker Question

Wishful thinking question:

How would you rank these **modes of teaching** (for lectures)
in terms of their **effectiveness for your (personal) learning**?

Assume a setup like this class:
70 students in a standard lecture hall (fixed seat rows, capacity 100)

?

A F2F traditional lecture   **D** live stream + polls&chat

B F2F seminar-style lecture   **E** prerecorded videos

C video conference   **F** website + media

`sli.do/comp526`

My approach to lectures

My conclusions (from years of own experience and from 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. A small minority of students asks questions. ⤳ other backchannels

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

Components of COMP 526

Slido questions

immediate feedback
simple questions

Lectures

new material
discussions
big picture

Tutorials

practice problems
solve deep questions

Campuswire

collaborative Q&A knowledge base

Class tests

frequent test of
basic understanding

Programming tasks 1 & 2

find & realize creative solutions

Video presentation

disseminate knowledge

Overview of the module

Goals:

- ▶ build / enhance your toolbox of algorithmic methods and techniques
  - ⤳ focus on practical methods

- ▶ enable you to reason about and communicate algorithmic solutions
  - ⤳ level of abstraction, proofs, mathematical analysis

- ▶ enable you to apply, combine and extend methods

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Units:

- *0.* Administrativa & Proof Techniques
- *1.* Machines & Models
- *2.* Fundamental Data Structures
- *3.* Efficient Sorting
- *4.* String Matching
- *5.* Parallel String Matching
- *6.* Text indexing
- *7.* Compression
- *8.* Error-Correcting Codes
- *9.* Range-Minimum Queries

Assessments

$$
\begin{aligned}
\text{final mark} = \ & 0.5 \cdot \text{exam mark} \\
& + 0.1 \cdot \text{CA1 (video presentation) mark} \\
& + 0.1 \cdot \text{CA2 (programming puzzle 1) mark} \\
& + 0.1 \cdot \text{CA3 (programming puzzle 2) mark} \\
& + 0.15 \cdot \text{class test mark} \\
& + 0.05 \cdot \text{participation mark}
\end{aligned}
$$

= continuous assessment

(More details on CA tasks later in the term)

Class Tests

- ≈ *offload 15% of mark from exam to CA*
- ▶ several throughout term
- ▶ very short
  (1 practice question + 1 marked question)
- ▶ quick intermediate feedback

Bonus Points

- ▶ for good questions and answers on *Campuswire* class feed
- ⤳ earns **collective bonus points** for entire class
- ▶ bonus on class-test mark

Participation Marks

for good engagement, not correct answers!

- ▶ 5% for regular participation on *Slido*

What are clickers? Why use it?

▶ I use "clickers" as short term for any *student response system*
We will use Slido, a web-based system.

▶ 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.

⤳ marks for *participation*, not for correct answers!

Clicker Question

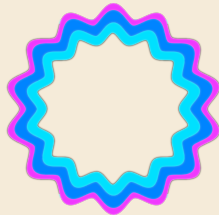Have you ever used an audience response system (Slido or similar) in lectures before?
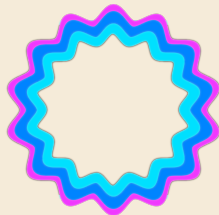
A Yes   **B** No

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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

Join via link on website:
`campuswire.com/p/G89660827`

Use in brower
`campuswire.com/c/G89660827`

or via app
`campuswire.com/download`

What is Campuswire?

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1. ***Class Feed:*** questions on material
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   similar to Slack or Discord

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

- Ask *public* questions
  - *"Why is $\lg(n^3) = \Theta(\log n)$?"*
  - *"Will there be classes during Carneval?"*

- *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

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

How to Campuswire

▶ My goals for Campuswire Q&A:

    1. **be fair**   Same answers for everyone

    2. **learning by teaching**   YOU will answer most questions!

    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

▶ You will collectively earn **bonus points**:

    ▶ 10 points for each good question

    ▶ 20 points for each good answer

    ▶ 10 extra points for each good answer that did not require clarification from us

⤳   every 100 points earns everyone *+1* on *class-test mark*

Video Presentation

- **Goals:**
  - engage with research literature
  - explore cutting-edge research in one topic
  - try out novel ways of disseminating knowledge

- **Schedule:**
  - till **week 3**: form teams of 3 – 4 students
  - till **week 5**: select an article
    - must be from

      COMMUNICATIONS OF THE **ACM**
      CACM.ACM.ORG

      a *contributed article*, *review*, *practice*, or *research highlight* from the last 3 years

  - till **28 March**: present article in video presentation and upload it!
    alternatively, create an interactive website / blog post

Philosophy of the module

COMP 526 is part of a *scientific* course.

Philosophy of the module

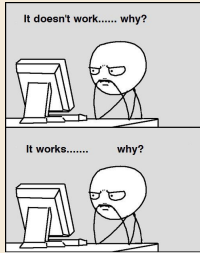COMP 526 is part of a *scientific* course.

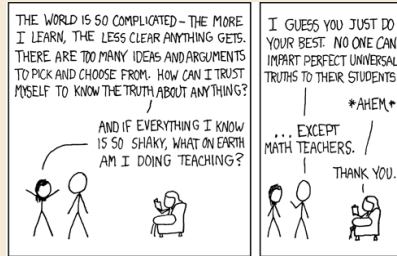Less . . .

Philosophy of the module

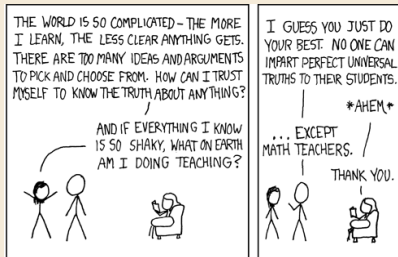COMP 526 is part of a *scientific* course.

Less ...

...and more

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Less . . .   . . . and more

⤳ Focus on *universal truths* of practical algorithms

- ▸ model of reality (machines, programs, data)
- ▸ quantitative predictions
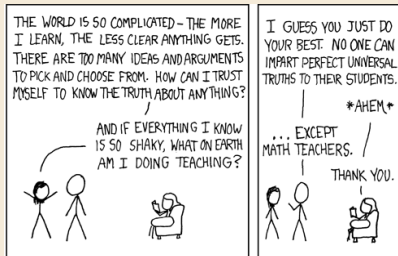- ▸ validate model in experiments

Philosophy of the module

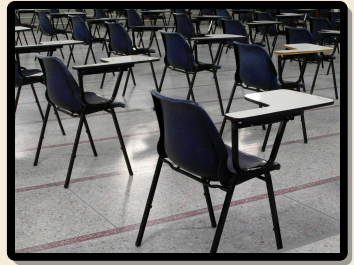COMP 526 is part of a *scientific* course.

Less . . .

. . . and more

⇝ Focus on *universal truths* of practical algorithms

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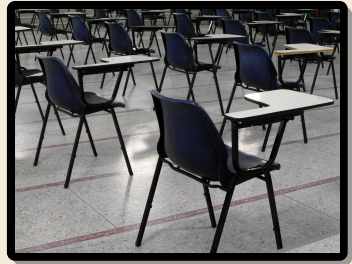⇝ Need some math techniques.   (up next)

But before we start . . .

But before we start . . .

Prior-knowledge survey

- not graded
- anonymous
- formative assessment
    - helps me to tailor teaching to needs
    - helps you to know where you and others stand
- Questions cover various topics, some or tough

> *I don't expect you can answer everything!*
> *We don't need everything for COMP526!*

`tiny.cc/526-survey`