Advanced Data Structures

Lecture 00: Course Overview
Florian Kurpicz
Organizational Matters

Lectures
- Monday 14:00–15:30 (50.34, 236)
- lecture only

Project (mandatory)
- topics will be handed out 03.05.2023
- coding project and small presentation
- 20% of the final grade
- requires additional registration

Oral Exam
- 20 minutes
- 80% of the final grade
- pizza marks content not relevant for exam

Office Hours (Room 208)
- Monday 15:45–16:30 (lecture period)
- by appointment (otherwise)
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Materials

Slides
- published before the lecture
  (https://ae.iti.kit.edu/4719.php)
- or in ILISA
- before means like 10 to 15 minutes before

Recordings
- recordings exist online
  (https://youtube.com/@kurpicz)
- new topics will be recorded
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### Additional Material
- references to literature included
- most likely no script
- MIT course (some topics match)
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<td>- dynamic bit vectors and succinct trees</td>
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<td>- succinct graphs</td>
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<td><strong>Integers</strong></td>
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<td>- range minimum queries (lowest common ancestor queries)</td>
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<td>- vEB-tree and fusion trees</td>
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<td><strong>External Memory</strong></td>
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## Gap Between Theory and Practice (Lecture AE Sanders)

### Different Viewpoints

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- **Theory**
  - Application model
  - Machine model
  - Algorithms
  - Data structures
  - Complexity measure
  - Efficiency

- **Practice**
  - Application model
  - Machine model
  - Algorithms
  - Data structures
  - Complexity measure
  - Efficiency

### Key Terms
- Simple application model
- Complex machine model
- Real algorithms
- Arrays, ...
- Worst case complexity measure
- Asymptotic efficiency