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 08.05.2023
- 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://algo2.iti.kit.edu/4521.php)
- before means like 10 to 15 minutes before

Recordings
- recordings exist online
  (https://youtube.com/@kurpicz)
- new topics will be recorded
## Materials

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### Additional Material
- References to literature included
- Most likely no script
- MIT course (some topics match)
Content

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<th>Trees/Grahps</th>
<th>Integers</th>
<th>Strings</th>
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<td>- bit vectors and succinct trees</td>
<td>- range minimum queries (lowest common ancestor queries)</td>
<td>- string B-trees and suffix arrays</td>
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<td>- dynamic bit vectors and succinct trees</td>
<td>- predecessor queries</td>
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**Trees/Graphs**
- bit vectors and succinct trees
- dynamic bit vectors and succinct trees
- succinct graphs

**External Memory**
- cache-oblivious B-trees
- buffer trees and EM lookup

**Integers**
- range minimum queries (lowest common ancestor queries)
- predecessor queries
- vEB-tree and fusion trees

**Strings**
- string B-trees and suffix arrays
- compressed suffix array and suffix tree
### Different Viewpoints

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<tr>
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<th>Practice</th>
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<tr>
<td>simple</td>
<td>machine model</td>
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**5/5**  
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Institute of Theoretical Informatics, Algorithm Engineering