A Few Words About Me

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1996–2001 Diploma in Physics, U Konstanz
2001–2005 Research assistant, DBIS Group, U Konstanz
2005–2007 Research assistant, Database Group, TU München
Oct 2006 PhD in Computer Science (XML query processing)
2007–2008 Postdoc, IBM T. J. Watson Research Center, NY, USA
2008–2013 Senior Researcher, Systems Group, ETH Zurich
since 4/2013 Full Professor, DBIS Group, TU Dortmund University

Topic: Database systems on modern computing hardware
What this Course is About

**TPC-E Industry Benchmark** (modeling a brokerage firm)
- 2.3M customers; 11.5M accounts; 2B holdings; 40B trades
- 18.5 TB initial database size

Current record: **4,593 tpsE (45,930 transactions/sec total)**!

### Numerical Quantities Summary

<table>
<thead>
<tr>
<th>Response Time (in seconds)</th>
<th>Minimum</th>
<th>Average</th>
<th>90th Percentile</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broker-Volume</td>
<td>0.01</td>
<td>0.03</td>
<td>0.06</td>
<td>0.86</td>
</tr>
<tr>
<td>Customer-Position</td>
<td>0.01</td>
<td>0.02</td>
<td>0.04</td>
<td>4.71</td>
</tr>
<tr>
<td>Market-Feed</td>
<td>0.01</td>
<td>0.02</td>
<td>0.04</td>
<td>4.68</td>
</tr>
<tr>
<td>Market-Watch</td>
<td>0.01</td>
<td>0.03</td>
<td>0.06</td>
<td>0.62</td>
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<tr>
<td>Security-Detail</td>
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<td>0.01</td>
<td>0.02</td>
<td>5.21</td>
</tr>
</tbody>
</table>

**How can databases provide such throughput, yet be transaction-safe?**
Architecture of a DBMS / Course Outline

Web Forms  Applications  SQL Interface

SQL Commands

Executor  Parser

Operator Evaluator  Optimizer

Transaction Manager

Lock Manager

Files and Access Methods

Buffer Manager

Disk Space Manager

Recovery Manager

DBMS

data files, indices, ...

Database

Organizational Matters

Lecture

- Tuesdays, 14–16h, Room OH 14, E.02
- Wednesdays, 8–10h, Room OH 14, 304
- Course website: http://dbis.cs.tu-dortmund.de/cms/de/lehre/ws1314/arch-dbms

Please visit this website regularly. I will frequently post new information during the semester.

Exercises

- Wednesdays, 10-12h, Room OH 14, 304
- First exercise: next week (Oct 23, 2013)
- Participation is not mandatory, but highly recommended.
Course Setup

- I’d like to make this course highly **interactive**.
  - Please speak up, discuss, ask questions!
- The material we discuss is relevant in **practice**.
  - We’ll provide practical examples and exercises.
  - You get most out of this course by actively participating in (and solving) the **exercises**.
Literature


- Dennis Shasha and Philippe Bonet. *Database Tuning*. Morgan-Kaufmann.

- ...or pick your own favourite in the library — most text books about advanced database topics will do.

I’ll also sometimes point to specific research papers and you’re welcome to search for additional background reading. Search engines like Google Scholar are your friend.
You might also be interested in...

...the course **Data Processing on Modern Hardware**
- Summer Semester
- Many similar concepts, geared to exploit the characteristics of modern computing hardware.

...doing your **Master Thesis** with me
- Chance to participate in the forefront of research.
- Many ways to join, approach me if you’re interested.