

Seminar: Modern Database Systems

Kickoff Meeting

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Overview

Weekly Meeting

- Monday, 14:00 - 16:00, starting April 25, 2022
- Room MI 02.09.014
- 2 presentations per meeting
- [There will be an attendance log](#)

Required Work

- Seminar paper (≤ 5 pages)
- Sample implementation (C++)
- Presentation (20 minutes + 10 minutes discussion)

Organization

Registration through matching system

- Write an email to mds@mailkemper.in.tum.de. if you are interested
 - Subject should be: [DBSeminar] Kickoff Meeting
 - Emails will be filtered based on this subject
- **Register for the seminar on**
<https://matching2.in.tum.de/m/b99vaa2-seminars-ss2022-second-round>

After matching: Check in with us for your preferred topic

1. Check in **soon after matching** for paper recommendations (preferences considered FCFS)
2. Check in when rough structure is planned
3. Check in when first draft is ready

Due Dates

- Structure: ca. 4 weeks prior to presentation date
- Presentation slides: 1 week prior to presentation date
- Seminar paper and finished implementation: 2 weeks after presentation date

Preliminary Topic List

Transactions

- Fast Serializable Multi-Version Concurrency Control for Main-Memory Database Systems
- Cicada: Dependably Fast Multi-Core In-Memory Transactions
- Speedy transactions in multicore in-memory databases
- Hekaton: SQL server's memory-optimized OLTP engine
- HyPer: A hybrid OLTP&OLAP main memory database system based on virtual memory snapshots
- Tictoc: Time traveling optimistic concurrency control

Locks

- Optimistic Lock Coupling: A Scalable and Efficient General-Purpose Synchronization Method
- Scalable and robust latches for database systems

Sampling and Statistics

- Optimal random sampling from distributed streams revisited
- Concurrent online sampling for all, for free
- alpha to omega: the G(r)eek Alphabet of Sampling
- Small Selectivities Matter: Lifting the Burden of Empty Samples

Index Structures and Compression

- Contention and Space Management in B-Trees
- The adaptive radix tree: ARTful indexing for main-memory databases
- FSST: Fast Random Access String Compression

Storage

- Implementing optimized VFS for PMEM in SQLite
- Benchmarking of Computational Storage Devices

Sub-operators

- Pull-based interpretation of Sub-Operators
- Push-based interpretation of Sub-Operators

<https://db.in.tum.de/teaching/ss22/seminarModernDatabaseSystems/>