PhD Position: Trajectory Database Systems (m/f/d), 100%

Join our interdisciplinary research network at the newly founded Thurgau Institute for Digital Transformation (TIDIT) in Kreuzlingen, Switzerland, and help found the Data Systems (DS) group. Work on trajectory database systems in close collaboration with the University of Konstanz and the HTWG Konstanz.

At the Data Systems group, we focus on data and database systems for real-world applications, handling large-scale trajectory and spatio-temporal data. Trajectory data track object movement, for example, of vehicles, people, or animals. Trajectory data raise research challenges in efficient storage, complex querying, noise/uncertainty, and privacy protection.

Our research advances systems for trajectory data management, including foundational data models, expressive query operators, federated query processing, and trajectory-aware query optimization. We target applications like urban mobility (taxi trip planning), animal behavior research (e.g., Movebank), and logistics (fleet movement data).

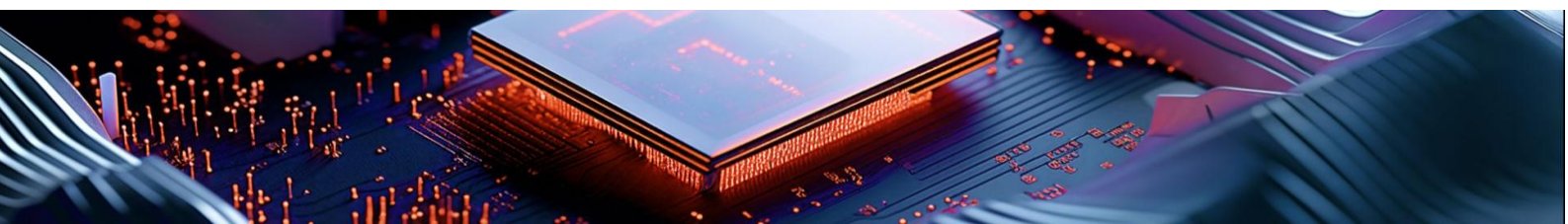
Learn more about us at: https://tidit.ch/data_systems/

Your research focus topics will include (but are not limited to):

- Designing data models and query abstractions for trajectory data that bring together trajectories, time series, and relational data.
- Exploring new perspectives on trajectory data representations (e.g., graph representations) in a data systems context.
- Developing advanced query optimization techniques that exploit the specific characteristics of trajectory data.
- Investigating the challenges of trajectory similarity search from a data systems perspective.

We are currently inviting applicants with:

- Master's degree in computer science, or a closely related field.
- Strong foundation in database systems (e.g., relational databases, query processing, indexing, and data modeling).
- Proficiency in systems programming (e.g., Rust, C++, Java) and a commitment to clean, high-quality code.
- Strong communication skills and a collaborative mindset, with the ability to work effectively in an interdisciplinary team.
- Fluency in English (written and spoken).



What we offer:

- **Collaborative Environment:** Join a team-oriented culture at TIDIT's lakeside campus in Kreuzlingen and benefit from flexible hybrid work options.
- **Vibrant regional network:** Benefit from close ties to the University of Konstanz, including the Centre for the Advanced Study of Collective Behaviour (CASCB), and HTWG Konstanz, plus an active collaboration with TIDIT's Probabilistic AI group.
  Opportunities to engage with academic and industry partners in mobility, environmental monitoring, and collective behavior research.
- **Mentoring:** Thrive in a supportive setting, take advantage of guidance for publishing in top data management and systems venues (e.g., VLDB, SIGMOD, SIGSPATIAL) by senior researchers.
- **Leisure:** Enjoy the vibrant student life in the city of Konstanz and the outdoor activities at Lake Constance, such as sailing, hiking, and skiing.
- **Swiss PhD Salary** and funding for conference travel.

We look forward to your ***CV*** to johann.bornholdt@tidit.ch. Please submit all documents as a single PDF file with a subject line: ***PhD Position: Trajectory Database Systems***. Applications will be reviewed on a rolling basis, with no fixed deadline, so early submission is encouraged.

For questions feel free to contact Johann Bornholdt, johann.bornholdt@tidit.ch.