SHORT-PAPER

The International Workshop on Spatio-Temporal Data Intelligence and Foundation Models

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The International Workshop on Spatio-Temporal Data Intelligence and Foundation Models

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Abstract

Spatio-temporal data intelligence, which includes sensing, managing, and mining large-scale data across space and time, plays a pivotal role in understanding complex systems in real-world applications, such as urban computing and smart cities. With the rapid evolution of foundation models and their growing potential to transform spatio-temporal analytics, we propose a comprehensive half-day workshop (with at least 5 accepted papers, 3 keynote talks, 1 panel discussion, and over 50 attendees) at CIKM 2025, catering to professionals, researchers, and practitioners who are interested in spatio-temporal data intelligence and foundation models to address real-world challenges. The workshop will not only offer a platform for knowledge exchange but also acknowledge outstanding contributions through a distinguished Best Paper Award. A dedicated panel discussion will explore recent advances, emerging trends, and open challenges in integrating spatio-temporal data and emerging machine learning techniques, fostering dialogue between academia and industry. Note that this will be the eleventh time that our core members have organized a similar workshop. The previous 10 workshops were hosted in top-tier data mining and management venues, e.g., SIGKDD, WWW, and IJCAI, each of which attracted over 60 participants and 25 submissions on average.

CCS Concepts

• **Information systems** → **Location based services**; **Spatial-temporal systems**.

Keywords

Spatio-temporal Data Intelligence, Foundation Model

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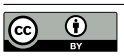

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1 Workshop Objectives, Goals, and Expected Outcome

The continued digitization of societal processes and the accompanying deployment of sensing technologies generate increasingly massive amounts of ST data, fueling a variety of real-world applications [2–4], e.g., intelligent transportation systems and weather forecasting. Mining actionable insights from such complex ST data across space and time poses unique challenges, including heterogeneous data management and modeling and ensuring scalability in real-time applications. Our objective is to provide a platform for researchers, practitioners, and stakeholders from diverse fields such as data mining/management and machine learning to explore unique challenges and opportunities provided by ST data. This workshop aims to address the growing need for innovative methods and practical tools for mining ST data, discussing the challenges and ethical considerations, and exploring future real-world applications. In addition, ST foundation models [1] have emerged as a new paradigm, offering a unified framework capable of solving various ST tasks. Driven by the success of foundation models, especially LLMs, it has become possible to develop more generalized and universal solutions that can be adapted to different tasks. We plan to further provide a dedicated forum for in-depth discussion on this emerging research frontier.

Building upon the experience from the preceding workshop editions, our anticipation for the upcoming event is to host 3 keynote talks, a minimum of 5 accepted full/short papers, and a panel discussion during this comprehensive half-day workshop. We envisage strong international participation with over 50 attendees. Additionally, the Best Paper Award will be meticulously determined through rigorous reviews and presentation evaluations. Further, approximately 3-4 accepted papers will undergo further expansion and subsequently be considered for publication in a special journal issue. This strategic initiative aims to enhance the visibility of the workshop, fostering high-quality submissions.

2 Workshop Theme and Topics

The workshop encourages submissions of innovative solutions for a broad range of spatio-temporal (ST) data intelligence and foundation models. Topics of interest include but are not limited to the following:

- Cutting-edge machine learning based algorithms for ST data modeling,
- Developing foundation models or utilizing LLMs for ST data processing and analytics,
- Multi-modal and cross-domain ST data fusion, integrating ST, visual, and textual information,
- Uncertainty, fairness, or privacy-aware ST data mining
- Techniques for ST data generation, forecasting, classification, and anomaly detection,
- A hands-on demo, tutorial, benchmark, and survey for ST data intelligence,
- Real-world ST applications in transportation, environment, public safety, etc.

We are committed to inviting distinguished experts from around the globe as speakers. The potential invited keynote speakers are as follows, who are experts holding prestigious experience in spatio-temporal data intelligence.

- Philip S. Yu, University of Illinois at Chicago, USA
- Yu Zheng, JD Technology, China
- Enhong Chen, University of Science and Technology of China, China
- Kang G. Shin, University of Michigan, USA
- Themis Palpanas, University Paris Cite, France
- Jessie Zhenhui Li, Yunqi Academy of Engineering, China

3 Target Audience

This workshop is designed for a diverse audience of professionals, researchers, and practitioners who are interested in fields of spatio-temporal data intelligence and foundation models. We assume participants have a basic understanding of artificial intelligence and data mining, making the content suitable for professionals and students alike.

4 Workshop Program Format

The organizers will be able to attend the conference and organize the workshop in person. The detailed program and timeline are shown in Table **??**.

5 Workshop Relevance

The proposed workshop is an excellent fit for CIKM 2025 as it focuses on spatio-temproal data intelligence and foundation model, key areas that align with the conference core themes, including special data processing, artificial intelligence, and generative AI for data and knowledge management. By addressing critical challenges in handling large-scale and heterogeneous data across space and time, the workshop fosters interdisciplinary research in various real-world domains. It proven track record in previous editions ensures high engagement and valuable contributions to the CIKM conference.

	time	Schedule
1	8:00–8:10	Opening and Welcome
2	8:10–9:10	Keynote #1 & Kyenote #2
3	9:10–9:50	Session 1: Two paper Presentation
4	9:50–10:05	Coffee Break
5	10:05–10:35	Keynote #3
6	10:35–11:15	Session 2: Three paper Presentation
7	11:15–11:45	Panel Discussion
8	11:45-12:00	Award Ceremony & Closing Remark

6 Related Workshop

6.1 Past Workshops from Organizers

In recent years, our organizers have organized

- UrbComp@KDD'22, KDD'23, KDD'24, KDD'25, each of which with 30 submissions on average, 6∼9 acceptances, and over 70 attendees
- WebST@WWW'25 with 20+ submissions, 12 acceptances, and over 50 attendees
- AI4TS-@IJCAI'25, WWW'25, 20+/20+ submissions and 5/3 acceptance, over 70 attendees
- Big Data Management and services@DASFAA'23, DASFAA'24, DASFAA'25 with minimum 20 submissions, 4 acceptances, and over 50 attendees

6.2 Other Related Workshops

Other related workshops existed in recent conferences, including

- Workshop on Multivariate Time Series Analytics: MulTiSA-@ICDE'24, ICDE'25
- Time Series in the Age of Large Models@NeurIPS'24
- Web and The City@WWW'25

While the first two existing workshops focus only on time series data, and the third studies AI for smart cities using web-sourced data, our workshop takes a broader perspective. We explore multi-faceted ST data, e.g., trajectories, time series, and ST images, and integrate emerging foundation models, enabling more comprehensive and impactful applications.

7 Program Committee

Our organizing committee encompasses members from various countries and regions, including scholars and industry experts from academia, industry, and government sectors. This diversity enables us to integrate different viewpoints and foster interdisciplinary collaboration. Additionally, our team includes individuals of different genders. Here is the representative PC list:

- Gao Cong, Nanyang Technological University, Singapore
- Leman Akoglu, Carnegie Mellon University, USA

- Roger Zimmermann, National University of Singapore, Singapore
- Cecilia Mascolo, University of Cambridge, UK
- Samuel Madden, MIT, USA
- Jie Bao, JD Technology, China
- Paul Boniol, Inria, France
- Qingsong Wen, Squirrel AI, USA
- Yong Li, Tsinghua University, China
- Flora Salim, University of New South Wales, Australia
- Raymond Wong, The Hong Kong University of Science and Technology, Hong Kong
- Xing Xie, Microsoft Research Asia, China
- Wei-shinn Ku, Auburn University and National Science Foundation, USA
- Cheng Long, Nanyang Technological University, Singapore
- Daniele Quercia, Bell Labs, Cambridge, UK
- Claudio T. Silva, New York University, USA

8 Participation and Selection Process

This workshop will be open to researchers and practitioners from both academia and industry who are interested in but not limited to spatio-temporal data intelligence and foundation models. Participants will be selected based on the peer-review by program committee considering the relevance and quality of their submitted papers or abstracts. We also welcome invited talks and panel discussions to encourage broader engagement. The selection process ensures diversity in perspectives and high-quality contributions aligned with the workshop's objectives.

9 Organizers' Background

General Chair #1: Hao Miao
Affiliation and Email: The Hong Kong Polytechnic University, hao.miao@polyu.edu.hk
Short bio: Hao Miao is a Research Assistant Professor at The Hong Kong Polytechnic University, focusing on spatio-temporal data analytics and trajectory computing. He has published over 20 research papers in the top venues, such as PVLDB, ICDE, and SIGKDD. He received a PVLDB and SIGIR CIKM 2020 Travel Award and organized two tutorials at WWW 2025 and ACM MM 2025.

General Chair #2: Yan Zhao
Affiliation and Email: University of Electronic Science and Technology of China, zhaoyao@uestc.edu.cn
Short bio: Yan Zhao is a Professor at the University of Electronic Science and Technology of China, specializing in spatio-temporal databases and data mining. She has published over 80 peer-reviewed papers in top-tier conferences and journals in big data management. She received the ACM SIGSPATIAL China Chapter Doctoral Dissertation Award in 2021. She has organized two workshops at DASFAA 2023 and 2025.

General Chair #3: Yuxuan Liang
Affiliation and Email: Hong Kong University of Science and Technology (Guangzhou), yuxliang@outlook.com
Short bio: Yuxuan Liang is a tenure-track Assistant Professor at Hong Kong University of Science and Technology (Guangzhou), working on the research, development, and innovation of spatio-temporal data mining and urban computing. He has published 90+ papers in prestigious venues (e.g., TPAMI, AI, TKDE, KDD, NeurIPS, and WWW). His publications have gathered 6,300 citations on Google Scholar, with h-index of 41. He has received ACM SIGSPATIAL China Rising Star Nomination, Singapore Data Science Consortium Research Fellowship, and The 23rd China Patent Excellence Award. He has been recognized as Stanford/Elsevier Top 2% Scientists.

General Chair #4: Bin Yang
Affiliation and Email: East China Normal University, byang@dase.ecnu.edu.cn
Short bio: Bin Yang is a Chair Professor at East China Normal University, working on data-driven decision intelligence, with a focus on time series and spatio-temporal data. He has published over 100 research papers on top-tier conferences and journals.

General Chair #5: Kai Zheng
Affiliation and Email: University of Electronic Science and Technology of China, zhengkai@uestc.edu.cn
Short bio: Kai Zheng is a professor of computer science with University of Electronic Science and Technology of China. He received his PhD degree in Computer Science from The University of Queensland in 2012. He has been working in the area of spatial-temporal databases, uncertain databases, social-media analysis, in-memory computing and blockchain technologies. He has published over 100 papers in prestigious journals and conferences in data management field such as SIGMOD, ICDE, VLDB Journal, ACM Transactions and IEEE Transactions. He is a senior member of IEEE.
General Chair #6: Christian S. Jensen
Affiliation and Email: Aalborg University, csj@cs.aau.dk
Short bio: Christian S. Jensen is a professor at Aalborg University. His research focuses on analytics and management in relation to time series and spatio-temporal data. He is a fellow of the ACM and IEEE. He is a member of the Academia Europaea, the Royal Danish Academy of Sciences and Letters, and the Danish Academy of Technical Sciences. Recent awards include the 2022 ACM SIGMOD Contributions Award and the IEEE TCDE Impact Award.

10 Acknowledgments

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