

# High-Performance Computing for Spatial-Temporal Data Analytics

**SPECIAL  
ISSUE  
PROPOSAL**

Numerous applications are being developed in the Era of Computing on the basis of location-aware services and information extraction from the environment that serves variety of purposes. The location-aware data collection is made possible with the use of spatial-temporal data collection that is done through various sensors like GPS. Moreover, the data collection generally includes the data that is hosted with both time and space that is linked to a particular location. Spatial-temporal data gathering is used to track the movements of humans and vehicles, as well as to monitor climatic change. Additionally, business process modelling, astrology, agriculture, and transportation are all broad areas of use related to the spatial temporal data that are used in real time environment. Indeed, the analytics based on spatial-temporal data collection plays a vital role in analysing the information gathered by using spatial sensors like the movement tracking of individuals during the Covid-19 pandemic. Although maintaining the data collected and analysed for geographical temporal data is difficult owing to the vast number of data and the complicated structure of spatial data. Additional challenges include the isolation of the sensors used in the collection of spatial data, such as the collection of data from Twitter, to be coupled with map applications for location identification could be forming a complex data source called spatial join, which is difficult to collaborate and compute.

High-performance computing could be used in solving the challenges that are faced by spatial-temporal data analytics. Moreover, the nature of high-performance computing in solving complex problems and the use of Floating-point Operations per second (FLOP) could process millions of data per second. The implementation of high-performance computing in spatial-temporal data analytics could solve problems faced in complex operations and increase the performance of the system. The typical applications that could be generated with the coupling of the technologies include weather monitoring, supply chain management, tracking of goods, location-aware sensor data collection, and medical applications to predict diseases.

Moreover, the algorithms that serve the purpose of using high-performance computing in spatial-temporal applications are the deep learning methods, neural networks, AI- edge and mobility management algorithms. The issue explores the applications and problems associated with spatial-temporal data analysis utilising high-performance computing using disruptive technologies like the artificial intelligence, deep learning, edge computing and IoT.

## **List of topic areas include, but are not limited to:**

- Mobility management in spatial-temporal data application for implementation in high-performance computing systems
- 6G and beyond in the applications related to spatial-temporal data collection
- Spatial and temporal data collection and the challenges related to its implementation in industry 4.0
- High-performance computation in spatial data analysis along with blockchain implementation and Light detection and ranging (LiDAR) technology
- Novel predictive and descriptive analysis for spatial and temporal data analytics
- Machine and Deep Learning methods in High-performance computing coupled with spatial data analysis
- Covid-19 patient detection and isolation with spatial and temporal data analytics by spatial sensors implementation in public
- Adoption of Edge computing for decentralisation of spatial and temporal data

- Ethical implementation of spatial and temporal data analytics: challenges and implementation issues
- Data warehousing for spatial and temporal data in high performance computing applications.

"All papers must be submitted using the journal's peer review management systems (see Author Instructions on the IDT website <https://www.iospress.com/catalog/journals/intelligent-decision-technologies>). We do not accept submissions by email.

IMPORTANT: Submissions for a special issue must include the designation 'Special Issue' and be submitted under this designation. Papers should explain the topic as relevant to decision making and intelligent methods."

## Proposed Special Issue Dates:

Manuscript Submission Deadline: 30 <sup>st</sup> March 2024	Authors Notification: 20 <sup>th</sup> July 2024
Revised Papers Due: 30th May 2024	Final notification: 30th Sep 2024

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**Dr. Achyut Shankar [Managing Guest Editor]** Dr. Achyut Shankar is currently working with University of Warwick, United Kingdom. He has published more than 95 research papers in reputed international conferences & journals in which 75 papers are in SCIE journals. He is a member of ACM and has received research award for excellence in research for the year 2016 and 2017. He had organized many special sessions with Scopus Indexed International Conferences worldwide, proceedings of which were published by Springer, IEEE, Elsevier etc.

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### Dr Zahid Akhtar

Dr. Akhtar is an Assistant Professor in the Department of Network and Computer Security at State University of New York Polytechnic Institute (USA) since August 2020. Prior to this, he was a Research Assistant Professor at University of Memphis, USA (2018-2020) and a Postdoctoral Fellow at INRS-EMT-University of Quebec, Canada (2016-2018), University of Udine, Italy (2013-2016), Bahcesehir University, Turkey

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