Editorial

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Biographical notes: Sugam Sharma obtained his PhD in Computer Science from Iowa State University, USA in 2013. He is currently working in CSSM, USA. His research interests include data science, sensor network, smart home, and social innovations. Previously, he also has worked as a software consultant at NAVTEQ Traffic Inc., and System Analyst at Ames National Laboratory, USA. He also holds MS in Computer Science from Jackson State University, USA and BE in Computer Science from Roorkee, India. Lately, his published work on eFeed-Hungers got international media attention. Subsequently, he founded a research-led startup, eFeed-Hungers.com.

Under the recent evolution of big data, the data science has witnessed the advancements from the data size and the data complexity to the computational capabilities. The space, time, or space-time dimensions are unobtrusively tagged to at least most of the (big) data collected today. Therefore, the big data largely is spatio-temporal data, which is large in size and complex in nature and has challenged the existing storage capacity and classical data processing and management systems. Although, the spatio-temporal data such as satellite imagery and remote sensing data, weather forecasting and climate data, etc. regardless the medium and source of the collection has always been big and complex and has sought high-performance computational systems to process and perform analyses. Additionally, the evolution of the social media and the advancements in smart technologies, especially the smart devices such as smart phones, sensors, etc. have resulted into the generation of massive spatio-temporal data (text, images and videos) at a very high rate, which is even bigger, complex and convoluted in nature by many folds. This data is information-rich and offers big opportunities to churn out the useful information and informative patterns. Which help understand the social, technical and scientific dynamics of the diverse global communities for crucial, critical, and efficient decision making for the betterment of the human life eventually.

This inaugural issue publishes the novel and high impact research contributions in the area of spatio-temporal (big) data science. We received 20 papers in the submission pool with wide range of topics centred around the spatio-temporal (big) data. Each paper was highly scrutinised to gauge primarily the technical, scientific, and linguistic merits. The two rounds of double-blind peer reviews by international experts and subsequently, the additional multiple rounds of major to minor revisions helped us to find and select the high quality work and only seven papers could make through the final accepted stage.

Dileep Kumar Yadav and Karan Singh take the advantage of spatio-temporal data to advance the research in computer vision. They develop new efficient techniques to detect moving objects with adaptive dynamic background. The proposed technique claims better detection quality as compared to state-of-the art techniques. Consequently, the new technique better assists and benefits the real-time applications such as border surveillance, sea traffic, restricted and deep zones, etc.

Lavanya Sharma and Nirvikar Lohan also widely investigate the existing conventional and traditional techniques for object detection. Along with the exploration of the methods, the detailed investigation also explores the associated major challenges, the supported applications and the underneath resources such as datasets. The authors also have done extensive comparative study of some of the important peer techniques along with several performance metrics to gauge their robustness.

As mentioned earlier, the big data is information-rich, which means the amassed wealth of information due to the amount and speed of the data collection today that has merits and demerits. On the downside, it has given rise to the problems of information overload to the end users, especially the internet or online users.

Mohammed Hassan and Mohamed Hamada investigate these issues to find how the user can be assisted with suitable recommendations and developed new techniques with comparatively higher prediction and better recommendations. They employ the data to modern technology, called Artificial Intelligence more specifically the recommender systems (RSs) for better predictive analytics. The RSs help assist to an online user in intelligent and effective decisions making with the suitable recommendations for the suitable items based on the past or present interest and purchasing patterns of the user.

Bushra Siddique and Nadeem Akhtar also take on the information overloading issue, but for Twitter (big) data. They introduce a new topic-based hierarchical summarisation framework to deduce the contextual understanding and simplified human interpretation out of the massive Twitter data. Within the Twitter context, the topics are the broader subjects such as politics and sport, the users discuss in their tweets. The authors develop an algorithm to generate topic hierarchy from the given topics and effectively test it on 'Egyptair MS181 flight incident' topic.

Rubina Parveen et al. use the remote sensing and satellite (spatial) data to analyse, develop and test new algorithm to obtain more accurate information about the surface water to delineate the water areas. The authors use the colour transformation clustering methodology to extract the required features from an imagery. These features are to be furnished further to surface water detection methods to make the boundaries of the water bodies clearly visible and easily identifiable.

Tilottama Chakraborty et al. utilise the spatial data to improve the sustainability. They use the multi-criterion, multimodal predictive methods and soft-computing approaches for analyses and develop the new model to more accurately estimate the feasibility of the locations with higher potential energy, where a wave energy converter (WEC) much efficiently works. When installed at such locations, the WEC maximises its efficiency while utilises the potential wave energy of the estimated locations resulting in efficient input and output through WEC.

Tanuja Kumari Sharma and Hemraj Saini do an in-depth study on the state-of-the-art cloud collaboration environment with respect to the concurrent/co-editing editing by the several users from various distant locations. Although, cloud collaboration is highly cost effective, but co-authoring or co-editing requests may generate deadlock, long waiting condition and more importantly the writing conflicts. The authors favour the

multi-version approach to give non-conflicted and smooth co-editable access of an object to cloud collaborated users.

We hope these papers will be appealing to research, academia, and industry experts and inspire them for further advancements in the several existing and upcoming areas of spatio-temporal data science.