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Guest Editorial: Special issue on mobility analytics for spatio-temporal and social data

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The aim of this special issue is to capture recent advances in developing data-intensive applications that analyze spatio-temporal/societal data, in order to foster the exchange of new ideas on multidisciplinary real-world problems, propose innovative solutions, and stimulate further research in the area of mobility data management and analysis.

Mobility analytics is a timely topic due to the ever-increasing number of diverse, real-life applications, ranging from social media to land, sea, and air surveillance systems, which produce massive amounts of streaming spatio-temporal data, whose acquisition, cleaning, representation, aggregation, processing and analysis pose new challenges for the data management community.

The papers published in this issue constitute revised and extended versions of the accepted papers of the 2nd International Workshop on Mobility Analytics for Spatio-Temporal and Social Data (MATES 2018), held in conjunction with the 44th International Conference on Very Large Databases (VLDB), in Rio de Janeiro, Brazil, on August 31, 2018.

MATES received 20 submissions, each of which was carefully reviewed by three different reviewers, in order to select 8 papers to be presented during the workshop in Rio. The authors of these papers were invited to submit an extended version to this special issue of Geoinformatica. After a second round of reviews, five papers have been accepted to be published in this special issue.

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The following papers appear in this special issue:

[1] "*Regularized Topic-aware Latent Influence Propagation in Dynamic Relational Networks"*, by Shuhui Wang, Liang Li, Chenxue Yang and Qingming Huang;
[2] *"On the Composition and Recommendation of Multi-Feature Paths: A Comprehensive Approach"*, by Vincenzo Cutrona, Federico Bianchi, Michele Ciavotta and Andrea Maurino;
[3] *"A Hybrid CNN-LSTM Model for Typhoon Formation Forecasting"*, by Rui Chen, Xiang Wang, Weimin Zhang, Xiaoyu Zhu, Aiping Li and Chao Yang;
[4] *"A Spatially-Pruned Vertex Expansion Operator in the Neo4j Graph Database System"*, by Yuhan Sun and Mohamed Sarwat;
[5] *"Spatio-temporal Mining of Keywords for Social Media Cross-social Crawling of Emergency Events"*, by Andrea Autelitano, Barbara Pernici and Gabriele Scalia;

These papers cover a range of important topics related to mobility analytics for spatio-temporal and social data. Wang et al. [1] investigate influence propagation in social networks and propose a framework for modeling topic-aware influence propagation in dynamic network structures. Cutrona et al. [2] present a novel approach to enrich trajectory representations, based on semantic annotations, and use this information to recommend trajectories based on the user preferences. Chen et al. [3] propose a new model to predict the formation and intensity of typhoons, using spatio-temporal correlation of atmospheric and ocean variables. Sun and Sarwat [4] develop a new query operator for graph database systems that store spatial data, which optimizes the execution of graph queries that involve spatial predicates. Autelitano et al. [5] propose a new method for extracting relevant images and videos from social media during an emergency event, dynamically mining event-related keywords, aiming at following the evolution of an event.

Collectively, these five papers cover a broad range of social, spatial and temporal data related problems. They present a large variety of challenges that are currently being investigated, where social, spatial and temporal data are being used to extract relevant information for the society. Moreover, they contain novel techniques and approaches that are deemed relevant for many emerging applications related to mobility analytics.

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George A. Vouros (B.Sc, Ph.D) holds a BSc in Mathematics (1986), and a PhD in Artificial Intelligence (1992) all from the University of Athens, Greece. Currently he is a Professor in the Department of Digital Systems in the University of Piraeus and head of the AI-Lab in this Department. He has done research in the areas of Expert Systems, Knowledge Management, Collaborative Systems, Ontologies, and Agents and Multi-Agent Systems. He served/serves as program chair, chair and member of organizing / program committees of national and international conferences (ISWC, AAMAS, AAAI, IJCAI, ECAI, WI/IAT, AT, EUMAS, ICMLA, ESWC, CSCL, AIAI) and as member of steering committees/boards of international conferences/workshops (EURAMAS, SETN, AT, COIN). He is/was senior researcher in numerous EU-funded and National research projects (GSRT/AMINESS, FP7/Grid4All, FP7/SEMAGROW, COST/Agreement Technologies the most recent ones), and he recently coordinated the successful DART project (SESAR project) and datACRON Big Data project (H2020 ICT-16). George Vouros has served for many years as chair of the Hellenic A.I. Society board. Further details concerning his work can be found in http://ai-group.ds.unipi.gr/georgev/.

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