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Konstantinos Tserpes · Chiara Renso ·
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Multiple-Aspect Analysis of Semantic Trajectories

First International Workshop, MASTER 2019
Held in Conjunction with ECML-PKDD 2019
Würzburg, Germany, September 16, 2019
Proceedings

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Preface

An ever-increasing number of diverse, real-life applications, ranging from mobile to social media apps and surveillance systems, produce massive amounts of spatio-temporal data representing trajectories of moving objects. The fusion of those trajectories, commonly represented by timestamped location sequence data (e.g. check-ins and GPS traces), with generally available and semantic-rich data resources can result in an enriched set of more comprehensive and semantically significant objects. The analysis of these sets, referred to as “semantic trajectories”, can unveil solutions to traditional problems and unlock the challenges for the advent of novel applications and application domains, such as transportation, security, health, environment, and even policy modeling.

Despite the fact that the semantic trajectories concept is not new, we are now witnessing an increasing complexity in the forms and heterogeneity of the enrichment process producing new kinds of trajectory objects. These new objects call for novel methods that can properly take into account the multiple semantic aspects defining this new form of movement data. It is the very nature of the semantic trajectories that makes this analysis challenging. For instance, the data sources and formats are largely heterogeneous, placing hurdles in the fusion process; or their volumes are too large to process them in conventional ways. In the other cases the state of the semantic trajectories is updated at such a rapid pace, that it is very hard to explore them so as to get an indication of their latent semantics, or even process them in a consistent way since they cannot be stored. Another typical problem is with their unreliable and erroneous nature, where signals are arriving in a mixed order, with gaps and even errors. Similarly, the multiple aspects nature of semantic trajectories increases the difficulty of trajectory pattern mining.

The MASTER 2019 workshop was held in Würzburg, Germany, on September 16, 2019, in conjunction with ECML/PKDD 2019. The format of the workshop included a keynote speech and eight technical presentations. The workshop was attended by around 20 people on average.

This year we received 12 manuscript for consideration, from authors based in 8 distinct countries, from Japan, to Europe, to Brazil, and Canada. After an accurate and thorough single-blind review process with the help of the 22 members of the Program Committee, we selected 8 full papers for presentation at the workshop. The review process focused on the quality of the papers, their scientific novelty and applicability to existing Semantic Trajectory Analysis problems and frameworks. The acceptance of the papers was the result of the reviewers’ discussion and agreement. All the high-quality papers were accepted, and the acceptance rate was 66.66%. The accepted articles represent an interesting mix of techniques to solve recurrent as well as new problems in the Semantic Trajectory domain, such as data representation models, data management systems, machine learning approaches for anomaly detection, and common pathways identification.

The workshop program was completed by the invited talk entitled “Learning from our movements – The mobility data analytics pipeline” by Prof. Yannis Theodoridis from the University of Piraeus, Greece.

We would like to thank the MASTER 2019 Program Committee, whose members made the workshop possible with their rigorous and timely review process. We would also like to thank ECML/PKDD for selecting and hosting the workshop. Most importantly we would like to thank the emerging community of the Semantic Trajectories’ domain that attended the workshop from practically all around the world.

The workshop has been supported by the MASTER project (<http://www.master-project-h2020.eu>), which has received funding from the European Union’s Horizon 2020 research and innovation program under the Marie Skłodowska-Curie grant agreement No 777695.

October 2019

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