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# Foreword for the special issue of selected papers from the 1st ACM SIGSPATIAL Workshop on Security and Privacy in GIS and LBS

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The first Workshop on Security and Privacy in GIS and LBS (SPRINGL 2008) was organized on November 4, 2008 at Irvine (CA) in conjunction with the SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM GIS 2008). The goal of the SPRINGL workshop series is to provide a forum for researchers working in the area of geospatial data security and privacy. Both security and privacy are critical for geospatial applications because of the dramatic increase and dissemination of geospatial data in several application contexts including homeland security, environmental crises, and natural and industrial disasters. Furthermore, geospatial infrastructures are being leveraged by companies to provide a large variety of location-based services (LBS) able to tailor services to users. However, despite the increase of publicly accessible geospatial information only little attention is being paid to how to secure geospatial information systems (GIS) and LBS. Privacy is also of increasing concern given the sensitivity of personally-identifiable location information. This is despite major advancements that have been made in secure computing infrastructures and the secure and privacy-preserving management of traditional (relational) data in particular. The discussion at the workshop spanned across security and privacy aspects, as they relate to the management of geospatial data and to the development of emerging LBS. The present special issue of Transactions on Data Privacy contains four extended papers, focusing on privacy, that have been selected from the papers presented at SPRINGL 2008.

The first paper by Gabriel Ghinita is titled "Private Queries and Trajectory Anonymization: a Dual Perspective on Location Privacy". The paper presents a comprehensive survey of location privacy-preserving techniques supporting both private location queries in LBS and trajectory anonymization. The former group of techniques are classified based on the privacy-preserving method, i.e. spatial transformation vs. cryptography, and architecture, i.e. trusted third-party vs. two parties. The second part of the paper presents an overview of trajectory anonymization techniques for the protection of user's tracks in published data sets. The survey focuses on two classes of approaches aiming at preventing the re-construction of trajectories and supporting k-anonymity for trajectories, respectively.

The second paper by Dan Lin, Elisa Bertino, Reynold Cheng and Sunil Prabhakar is titled

"Location Privacy in Moving-Object Environments'". The paper presents a technique for the privacy-preserving computation of distance-based queries over moving objects, based on the use of a set of agents. Agents act as third parties who apply spatial transformations over locations before those locations are forwarded to the server or returned to the user. To prevent the re-construction of trajectories, the user's positions are sent to randomly selected agents chosen and then transformed using different spatial transformations. Queries are then solved with respect to transformed locations and then returned through the agents.

The third paper by Mehmet Ercan Nergiz, Maurizio Atzori, Yücel Saygyn and Bariş Güç is titled "Towards Trajectory Anonymization: a Generalization-Based Approach". The paper proposes a k-anonymity technique for trajectories. Anonymization is performed in two stages. In the first stage, trajectories are grouped in clusters of at least k trajectories. Then the trajectories inside each group are anonymized by generalizing the trajectories samples and applying a heuristic for string alignment. Finally a randomly generated trajectory is reconstructed from the anonymized set as representative trajectory.

The fourth paper by Nayot Poolsappasit and Indrakshi Ray is titled "Towards Achieving Personalized Privacy for Location-Based Services". The paper discusses the problem of privacy preferences, based on the observation that different individuals have different views of privacy. The paper then discusses various issues concerning the support for personalized privacy and describes a system supporting.

On the overall, the papers provide a comprehensive overview of the current state of the art in the area of privacy for location-based services and of some recent trends, such as the anonymization of trajectories and personalization of privacy preferences. We hope that you will enjoy reading the papers.

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