Dieter Pfoser, PhD

Professor and Chair, Department of Geography and Geoinformation Science
Steering Committee Member, Mason DataLab

Education
PhD, Computer Science, Aalborg University, Denmark

Key Interests

Data Management | Graph Algorithms | Crowdsourcing | Spatial Analysis | Machine Learning | Data Visualization | Data-Driven Storytelling | Web Development

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SELECT PUBLICATIONS

> J. Kim *et al.*, Location-based social network data generation based on patterns of life. *Proceedings of 21st IEEE International Conference on Mobile Data Management* (MDM), (2020).

> L. Zhang & D. Pfoser. Using OpenStreetMap point-of-interest data to model urban change: a feasibility study. *PLoS ONE* 14(2), (2019).

> A. Belesiotis *et al.*, Spatio-textual user matching and clustering based on set similarity joins. *The VLDB Journal* 27(3), (2018).

> B. Weaver & D. Pfoser. Investigation design: the structural elements of knowledge-seeking efforts. *Data & Knowledge Engineering* 119, (2019).

Research Focus

My work addresses various aspects of spatial and spatiotemporal database research, graph algorithms, and data mining as well as related areas such as computational geometry, transportation, and urban mobility research. I developed data management techniques for traffic management applications that allow us to compute traffic conditions based on tracking so-called probe vehicles and routing algorithms that provide the best routes based on traffic conditions. This technology has been commercialized and is currently used in fleet management products. Recent work relates to data mining for user-generated content, i.e., how to exploit data sets generated by Web users (social media, open data, Web content). Examples include explaining property prices based on urban change, studying the impact of social media in cancer awareness campaigns, and understanding urban mobility in support of urban planning, transportation, and economic impacts.

Current Projects

- Urban Simulation (DARPA): Using Agent-Based Modeling to create socially-plausible simulation of a large urban area

- Modeling Movement on Transportation Networks using Uncertain Data (NSF): A unified framework for aggregating and analyzing movement data and to provide tools for querying and predicting traffic volume and movement in urban environments

- Crowdsourcing Gazetteers to Communicate Place Dynamics (DOD): The extraction of places of interest (POIs) and their linkage (LOIs) to create a time-parameterized Web of Places that capture the meaning of locations assigned by human activities and events

- Urban Analytics (DataLab): The creation of high-resolution urban indicators for community resilience, behavioral health, and digital equity