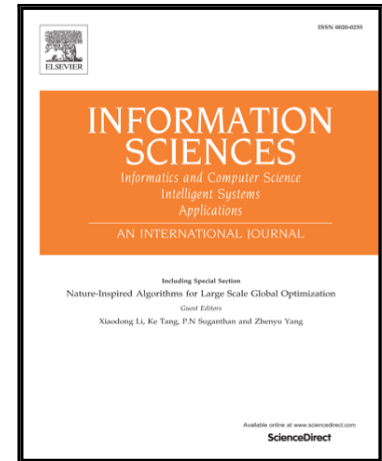


# Accepted Manuscript

## Achieving Differential Privacy of Trajectory Data Publishing in Participatory Sensing

Meng Li, Liehuang Zhu, Zijian Zhang, Rixin Xu

PII: S0020-0255(17)30594-7  
DOI: [10.1016/j.ins.2017.03.015](https://doi.org/10.1016/j.ins.2017.03.015)  
Reference: INS 12796



To appear in: *Information Sciences*

Received date: 6 May 2016  
Revised date: 7 March 2017  
Accepted date: 10 March 2017

Please cite this article as: Meng Li, Liehuang Zhu, Zijian Zhang, Rixin Xu, Achieving Differential Privacy of Trajectory Data Publishing in Participatory Sensing, *Information Sciences* (2017), doi: [10.1016/j.ins.2017.03.015](https://doi.org/10.1016/j.ins.2017.03.015)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# Achieving Differential Privacy of Trajectory Data Publishing in Participatory Sensing

Meng Li, Liehuang Zhu, Zijian Zhang\*, Rixin Xu

*Beijing Engineering Research Center of Massive Language Information Processing  
and Cloud Computing Application,  
School of Computer Science and Technology, Beijing Institute of Technology, 100081, China*

---

## Abstract

Trajectory data in participatory sensing is of great importance to the deployment and advancement of several applications, like traffic monitoring, marketing analysis, and urban planning. However, releasing trajectory data without proper sanitation poses serious threats to users' privacy. Existing work cannot achieve differential privacy perfectly because they use random and unbounded noises, which will leak users' privacy and violate the utility of the released trajectory data. Besides, existing trajectory merging method has to remove some trajectories from the input dataset. To solve both problems, we propose a novel differentially private trajectory data publishing algorithm with a bounded noise generation algorithm and a trajectory merging algorithm. Theoretical analysis and experimental results show that the privacy loss of our scheme is at least 69% less; the average trajectories merging time is 50% less than existing work.

*Keywords:* Differential privacy, trajectory, participatory sensing.

---

## 1. Introduction

Over the last few years, due to the development of location-aware mobile devices(e.g., GPS navigation systems and smart phones), it is getting easier for mobile users and service providers to generate and collect trajectory data.

5 Trajectory data, such as mobility traces, is being widely used in a variety of

---

\*Corresponding author

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات