

Trajectory-driven Influential Billboard Placement

Abstract

In this talk I will present our recent work on "Trajectory-driven Influential Billboard Placement" which is one of the Best Papers of KDD 2018.

In this work we propose and study the problem of trajectory-driven influential billboard placement: given a set of billboards U (each with a location and a cost), a database of trajectories T and a budget L , find a set of billboards within the budget to influence the largest number of trajectories.

One core challenge is to identify and reduce the overlap of the influence from different billboards to the same trajectories, while keeping the budget constraint into consideration. We show that this problem is NP-hard and present an enumeration based algorithm with $(1 - 1/e)$ approximation ratio. However, the enumeration should be very costly when $|U|$ is large. By exploiting the locality property of billboards' influence, we propose a partition-based framework PartSel. PartSel partitions U into a set of small clusters, computes the locally influential billboards for each cluster, and merges them to generate the global solution. Since the local solutions can be obtained much more efficient than the global one, PartSel should reduce the computation cost greatly; meanwhile it achieves a non-trivial approximation ratio guarantee. Then we propose a LazyProbe method to further prune billboards with low marginal influence, while achieving the same approximation ratio as PartSel. Experiments on real datasets verify the efficiency and effectiveness of our methods.

Speaker



Dr Zhifeng BAO
Senior Lecturer, RMIT

Zhifeng Bao is a tenured senior lecturer in Computer Science (equivalent to Associate Professor in US system), RMIT (Royal Melbourne Institute of Technology) University and an Adjunct Fellow at University of Melbourne, Australia. He received his PhD from the CS Dept at NUS in 2011. Zhifeng was the only recipient of the Best PhD Thesis Award in School of Computing and was the winner of the Singapore IDA (Infocomm Development Authority) gold medal. Zhifeng is a two-time winner of the Google Faculty Research Award. His research interests include data visualization, spatial data analytics and data integration. He served the PC Co-chair of WSDM19 Cup, DASFAA17 (workshop track), ER18 (demo track), and the PC member of top conferences such as VLDB17,18,20, SIGMOD18, SIGIR15-19, ICDE16-20, WWW 18-19. Zhifeng has received four best paper awards such as KDD19 (Best Paper Runnerup), DASFAA17 (Best Student Paper Runnerup), ADC16, and six best paper nomination such as KDD 2018, IEEE ICDE 2009, CIKM 2014.

Details

Friday, October 4, 2019
2:00 PM - 3:00 PM

Seminar Room 2.4, Level 2 SIS

School of Information Systems, Singapore Management University, 80
Stamford Road, Singapore 178902, Singapore

We look forward to seeing you at this research seminar.

Register

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