



Spatio-Temporal Data Analytics for Disease Transmission Modeling: Diffusion Networks, Underlying Factors, and Partial Observations

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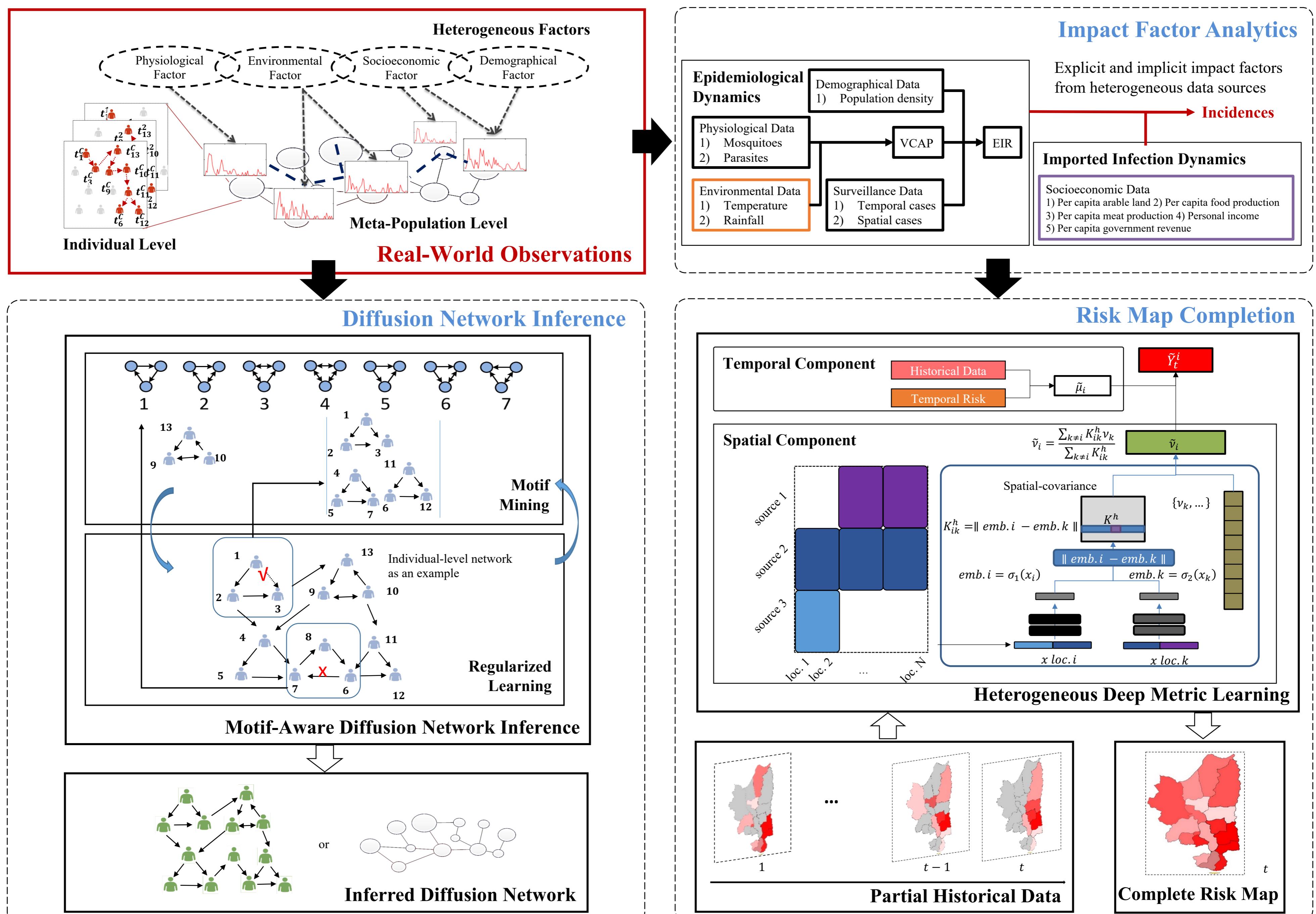
Project Period: Jan 2019 - Dec 2021

OBJECTIVES

1. To infer the structures of latent diffusion networks for active surveillance
2. To reveal the impact of underlying factors on geographic variations for epidemic prevention
3. To derive the epidemic risk map based on partial observations for disease control

HIGHLIGHTS

- Mining motif profiles of diffusion network for accurate inference [1, 2]
- Space-time model for systematically investigating the impact factors from heterogeneous data sources [3]
- Deep metric learning for risk map completion [4, 5]



SELECTED PUBLICATIONS

1. Tan Q, Liu Y, Liu J. Motif-aware diffusion network inference. Proceedings of Pacific-Asia Conference on Knowledge Discovery and Data Mining. Springer, 2018: 638-650.
2. Tan Q, Liu Y, Liu J. Motif-aware diffusion network inference. International Journal of Data Science and Analytics, Springer, 2018: 1-13.
3. Shi B, Tan Q, Zhou X N, et al. Mining geographic variations of Plasmodium vivax for active surveillance: A case study in China. Malaria Journal, 2015, 14(1): 216.
4. Tan Q, Liu J, Shi B, et al. Public health surveillance with incomplete data: Spatio-temporal imputation for inferring infectious disease dynamics. Proceedings of 2018 IEEE International Conference on Healthcare Informatics (ICHI). IEEE, 2018: 255-264.
5. Tan Q, Liu J, Shi B, et al. Addressing incomplete-data challenges in case surveillance for malaria elimination in the China-Myanmar border region: A machine learning approach. Malaria Journal (To appear)