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**Jianpeng Xu\*** (jianpeng.xu@gmail.com) and **Pang-Ning Tan** (ptan@msu.edu). *Incremental Learning on Large-scale Spatio-temporal Prediction via Tensor Decomposition.*

Predictive modeling of spatio-temporal data is an important task for many application domains. Such a task typically requires making robust predictions of a target variable at multiple geo-locations based on their historical observation and predictor variables. The multi-location prediction problem is naturally cast into a multi-task learning framework. While previous studies take into account the spatial smoothness on modeling the predictions at multiple locations, they are often developed for batch learning, which is not efficient for large-scale spatio-temporal data growing over time and space. As many of the previous works have focused primarily on improving prediction accuracy, the learned models are often too complicated for interpretation by the domain experts. Incorporating known patterns that drive the variability of the spatio-temporal data into a predictive modeling framework is also non-trivial. In this abstract, we introduce our work named WISDOM to overcome the aforementioned challenges. Specially, WISDOM applies tensor decomposition to learn the latent factors over space and time, while these factors are used for accuracy prediction. Incremental learning algorithm is developed to optimize the objectives when new data becomes available over space or time. (Received August 22, 2018)