專 題 演 講

講 者： Porf. Chang-Tien Lu （Virginia Tech）

題 目： Multi-task Learning for Transit Service Disruption Detection

簡歷：

Chang-Tien Lu is a Professor and National Capital Region Program Director in the Department of Computer Science and Associate Director of the Discovery Analytics Center at Virginia Tech. He received his Ph.D. from the University of Minnesota at Twin Cities in 2001. Dr. Lu currently serves as Associate Editor of ACM Transactions on Spatial Algorithms and Systems, Data & Knowledge Engineering, and GeoInformatica. He has regularly served on the organization and program committees of conferences, including as Program Chair of the 18th IEEE International Conference on Tools with Artificial Intelligence in 2006, and General Chair of the 17th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems in 2009 and the International Symposium on Spatial and Temporal Databases in 2017. He also served as Secretary (2008-2011) and Vice Chair (2011-2014) of the ACM Special Interest Group on Spatial Information (ACM SIGSPATIAL). His research interests include spatial databases, data mining, urban computing, and intelligent transportation systems. He has published over 150 articles in top rated journals and conference proceedings. His research has been supported by NSF, NIH, DoD, IARPA, VDOT, and DCDOT. He is an ACM Distinguished Scientist and Virginia Tech College of Engineering faculty fellow.

摘 要 ：

With the rapid growth in urban transit networks in recent years, detecting service disruptions in a timely manner is a problem of increased interest to service providers. Transit agencies are seeking to move beyond traditional customer questionnaires and manual service inspections to leveraging open source indicators like social media for deteting emerging transit events. In this paper, we leverage Twitter data for early detection of metro service disruptions. Inspired by the multi-task learning framework, we propose the Metro Disruption Detection Model, which captures the semantic similarity between transit lines in Twitter space. We propose novel constraints on feature semantic similarity exploiting prior knowledge about the spatial connectivity and shared tracks of the metro network. An algorithm based on the alternating direction method of multipliers (ADMM) framework is developed to solve the proposed model. We run extensive experiments and comparisons to other models with real world Twitter data and transit disruption records from the Washington Metropolitan Area Transit Authority (WMATA) to justify the efficacy of our model.