

## ABSTRACT

Liu, Ke M.S., Purdue University, December 2018. Pattern Exploration from Citizen Geospatial Data. Major Professor: Jie Shan.

Due to the advances in location-acquisition techniques, citizen geospatial data has emerged with opportunity for research, development, innovation, and business. A variety of research has been developed to study society and citizens through exploring patterns from geospatial data. In this thesis, we investigate patterns of population and human sentiments using GPS trajectory data and geo-tagged tweets. Kernel density estimation and emerging hot spot analysis are first used to demonstrate population distribution across space and time. Then a flow extraction model is proposed based on density difference for human movement detection and visualization. Case studies with volleyball game in West Lafayette and traffics in Puerto Rico verify the effectiveness of this method. Flow maps are capable of tracking clustering behaviors and direction maps drawn upon the orientation of vectors can precisely identify location of events. This thesis also analyzes patterns of human sentiments. Polarity of tweets is represented by a numeric value based on linguistics rules. Sentiments of four US college cities are analyzed according to its distribution on citizen, time, and space. The research result suggests that social media can be used to understand patterns of public sentiment and well-being.