

Topic: Learning from Smart City Data

Abstract: Rapid urbanisation brings severe challenges on sustainable development and living quality of urban residents. Smart cities aim to tackle these challenges to build better urban ecosystems. From a data-centric perspective, the key to the success of smart cities lies in the sophisticated data analysis with artificial intelligence, or more specifically, machine learning techniques. Deep learning has revolutionised the traditional artificial neural network research and has achieved remarkable milestones in many tasks on image processing, computer vision and natural language processing. In recent years, researchers have attempted to apply deep learning techniques in smart city applications. Much of the research effort has been made on, for example, intelligence transportation, smart healthcare, public safety, etc.

In this talk, we first provide an overview of the latest research on the convergence of deep learning and smart city from both technique and application perspectives. We then demonstrate a number of deep neural networks for some representative applications, e.g. traffic flow prediction, event detection, crisis classification and social media analysis on COVID-19. For each of the applications, we highlight the characteristics of the smart city data and the challenges in processing it; and share our experiences in dealing with these challenges based on different learning models, e.g. multi-modal data fusion and processing, semi-supervised learning, unsupervised learning, external knowledge integration, etc. We hope these could give a fair overview of the research on deep learning from smart city data, and motivate further research which would move one step further in creating truly intelligence for smart cities.