Postgraduate Seminar Series

Venue: Graduate Seminar Room
Date & Time: March 15, 2025 at 2:30 PM

Speaker Information

Md. Shahiduzzaman (Std No. 1015052079) is a part time M.Sc. student in the department of CSE, BUET. He completed his undergraduate studies from Military Institute of Science and Technology (MIST) in 2012. His research interest lies in the field(s) of Big Data, Data Mining, and Machine Learning. He is currently doing his postgraduate thesis under the supervision of Dr. Muhammad Abdullah Adnan. He will be speaking about his ongoing research in this talk.

Estimating the Most Utilized Path in the Traffic Network Using Trajectory Data

Urban traffic congestion severely undermines economic productivity and quality of life. Identifying the most utilized paths in road networks is thus crucial for effective transportation planning, yet current approaches often fall short by considering only isolated aspects of road usage. This study addresses this gap by introducing a methodologically novel, data-driven framework for comprehensive path utilization analysis. At its core is a weighted utility graph, constructed by integrating multi-source data including speed, traffic flow, spatial road attributes, and Points of Interest (POI), thereby moving beyond traditional network topology. We present the K-Length Most Utilized Path Ranking (KLUR) algorithm, a contribution inspired by frequent pattern mining, which operates on the weighted utility graph to derive composite priority scores (CPS) that reflect holistic path utilization. The KLUR framework strategically combines a partial Bayesian network for latent traffic flow and efficiency prediction, k-means clustering for optimal speed and capacity determination, Dijkstra's algorithm for optimal path computation, and parallel FP-growth for frequent path identification. Experimented using real-world and simulated traffic data, KLUR provides a holistic understanding of urban traffic dynamics. Experimental results demonstrate KLUR's efficacy in pinpointing pivotal path, offering significant potential to enhance transportation efficiency, optimize traffic management strategies, and revolutionize infrastructure investment decisions in smart cities.