Abstract

Time series data have been used in many applications, such as financial data analysis and weather forecasting. Similarly, trajectories of moving objects are often used to perform movement pattern analysis in surveillance video and sensor monitoring systems. These applications require finding, from among a large set of time series or trajectory data, those that are similar to a query data (the similarity-based retrieval problem). Most of this data are unclean, containing local time shifting and noise, while most of the previous work in this area has developed techniques that work on clean data. In this talk, I address similarity-based retrieval of time series and trajectory data in the presence of local time shifting and noise. In particular, I will present two novel distance functions: a metric distance function, called Edit distance with Real Penalty (ERP), that can support local time shifting, and, Edit Distance on Real sequence (EDR) that can handle noise as well as local time shifting, but is not metric. Since the proposed distance functions are computationally expensive, I propose several indexing and pruning methods to improve the retrieval efficiency. For ERP, a framework is developed to index time series or trajectory data under a metric distance function, which exploits the pruning power of lowering bounding and triangle inequality. For EDR, three pruning techniques mean value Q-grams, near triangle inequality, and histograms are developed to improve the retrieval efficiency.

Biography

Lei Chen received the BS degree in computer science from Tianjin University, Tianjin, China, in 1994, and the MS degree in computer science from Asian Institute of Technology, Bangkok, Thailand, in 1997. He recently completed his PhD degree in Computer Science at University of Waterloo, Canada, working on similarity-based retrieval, video and image data modeling and indexing, and video segmentation. His research interests include multimedia databases, indexing methods, data mining, machine learning, and image and video processing. He is a member of ACM and IEEE.

** ALL ARE WELCOME **

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