HKU-TCL Joint Research Centre for AI Workshop

Speaker:
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Title:
Meta Paths and Meta Structures: Discovery and Applications

Abstract:
A heterogeneous information network (HIN) is a graph model in which objects and edges are annotated with types. Large and complex databases, such as YAGO and DBLP, can be modeled as HINs. A fundamental problem in HINs is the computation of closeness, or relevance, between two HIN objects. Relevance measures, such as PCRW, PathSim, and HeteSim, can be used in various applications, including information retrieval, entity resolution, and product recommendation. These metrics are based on the use of meta paths, essentially a sequence of node classes and edge types between two nodes in a HIN. In this talk, we will give a review of meta paths, as well as how they are used to define relevance. In a large and complex HIN, retrieving meta paths manually can be complex, expensive, and error-prone. Hence, we will explore systematic methods for finding meta paths. In particular, we will study a solution based on the Query-by-Example (QBE) paradigm, which allows us to discover meta paths in an effective and efficient manner.

We further generalise the notion of a meta path to "meta structure", which is a directed acyclic graph of object types with edge types connecting them. Meta structure, which is more expressive than the meta path, describes complex relationship between two HIN objects (e.g., two papers in DBLP share the same authors and topics). We develop three relevance measures based on meta structure. We will also discuss the use of HINs in video recommendation.

Bio of Speaker:

Dr. Reynold Cheng is a Full Professor of the Department of Computer Science in the University of Hong Kong. He was an Associate and Assistant Professor in HKU during 2008-20. He received his BEng (Computer Engineering) in 1998, and MPhil (Computer Science and Information Systems) in 2000, from the Department of Computer Science in the University of Hong Kong. He then obtained his MSc and PhD from Department of Computer Science of Purdue University in 2003 and 2005 respectively. Dr. Cheng was an Assistant Professor in the Department of Computing of the Hong Kong Polytechnic University during 2005-08.

Dr. Cheng was granted an Outstanding Young Researcher Award 2011-12 by HKU. He received the Performance Reward in years 2006 and 2007 awarded by the Hong Kong Polytechnic University. He is a Assistant Director of the Interdisciplinary Strategic Research Cluster of HKU Engineering, and a Deputy Director of the Institute of Law and Technology. He is a Fellow of the HKU Institute of Transport Studies, and a Fellow of HKU Sau Po Centre on Ageing. He is the Chairman of the Engineering Admissions Committee, and the programme director of Computing and Data Analytics. He is an editorial board member of TKDE, DAPD, and IS. He is the PC co-chair of IEEE ICDE, lead PC chair of WISE 2019, vice chair of ICDE 2020, and area chair of ICDE 2017. He received an Outstanding Reviewer Award in ICDE 2019, and an Outstanding Service Award in CIKM 2009.