Social Networking and Recommender Systems

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ABSTRACT

Recently, with the popularity and development of innovative Web technologies, for example, Web 2.0, more and more advanced Web data based services and applications are emerging for Web users to easily generate and distribute Web contents, and conveniently share information in a collaborative environment. These newly enhanced Web functionalities make it possible for Web users to share and locate the needed Web contents easily, to collaborate and interact with each other socially, and to realize knowledge utilization and management freely on the Web. Two typical social Web service are Facebook and Twitter, which are becoming a global and influential information sharing and exchanging platform and data source in the world. As a result, Social Networks is becoming a newly emerging research topic in Web research although this term has appeared in social science, especially psychology in several decades ago.

On the other hand, despite of the Web-based data management research results in developments of many useful Web applications or services, like search engines, users are still facing the problems of information overload and drowning due to the significant and rapid growth in amount of information and the number of users. In particular, Web users usually suffer from the difficulties of finding desirable and accurate information on the Web due to two problems of low precision and low recall caused by above reasons. Recommender system is a specialized process that predicts user preference and recommends customized contents. Due the predominant requirement of personalized service, recommender systems have attracted a large amount of research attention in past decades.

In this talk, we aim to present a landscape of research advances in these two areas of social networking and recommendation systems, covering topics of link analysis and community detection, web mining, social-enhanced recommender systems, emergent event detection in social media, and outline some interesting research directions such as link prediction, social ranking, SNA in recommendation and personalized search.
Yanchun Zhang is a Professor and the Director of Centre for Applied Informatics at Victoria University, leading a multidisciplinary e-research program across the University. CAI’s program focuses on application driven and multidisciplinary research involving collaboration among experts from different fields, particularly in the ICT area and its applications in health care, community, business, and environmental studies. He obtained a PhD degree in Computer Science from The University of Queensland in 1991. Since then he has been an academic member at The University of Queensland, The University of Southern Queensland, and Victoria University. Prof. Zhang is an international expert in databases, data mining, health informatics, web information systems, and web services. He has published over 220 research papers in international journals and conference proceedings, and authored/editied 12 books. His research has been supported by a number of Australian Research Council’s project grants. His research has made some significant impacts on society. For example, the multidisciplinary research into e-health has produced software systems and mapping tools to assist relevant government/industry organisations establish health needs, allowing the development of policy based on firm evidence. Prof Zhang is the Editor-In-Chief of World Wide Web journal (Springer), and Health Information Science and Systems Journal (BioMed Central). He is Chairman of the International Web Information Systems Engineering Society (WISE Society). He has won VU’s Medal for Excellence in Research in 2005, and the VU Vice Chancellor’s Peak Award for Research and Research Training in Research Supervision in 2011, respectively. Prof Zhang was a member of ARC College of Experts from 2008 to 2010. He received the National “Thousand Talent Program” Award from China in 2010, and is currently a director on the Australia-China Joint Lab on Social Computing and E-Health, a joint initiative from Graduate University of Chinese Academy of Science and Victoria University.

GreenOrbs: Lessons Learned from Extremely Large Scale Sensor Network Deployment

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ABSTRACT

The world has just ten years to bring greenhouse gas emissions under control before the damage they cause becomes irreversible. This is a famous prediction raised by climate scientists and environmentalists recently. It reflects the increasing attention in the past decade from human beings on global climate change and environmental pollution. On the other hand, forest, which is regarded as the earth’s lung, is a critical component in global carbon cycle. It is able to absorb 10%-30% of CO2 from industrial emissions. Moreover, it has large capacity of water conservation, preventing water and soil loss, and hence reducing the chance of nature disasters like mud-rock flows and floods. Forestry applications usually require long-term, large-scale, continuous, and synchronized surveillance of huge measurement areas with diverse creatures and complex terrains. The state-of-arts forestry techniques, however, support only small-scale, discontinuous, asynchronous, and coarse-grained measurements, which at the same time incur large amount of cost with respect to human resource and equipments. WSNs have great potential in resolving the challenges in forestry. Under such circumstances, GreenOrbs is launched. The information GreenOrbs offers can be used as evidences, references, and scientific tools for human beings in the battle against global climate changes and environmental pollution.

The prototype system is deployed in the campus woodland of Zhejiang Forestry University. The deployment area is around 40,000 square meters. The deployment started in May 2009 and included 50 nodes. In November 2009 it was expanded to include 330 nodes. The system scale reaches 400 in April 2010. The duty cycle of nodes is set at 8%. The network diameter is 12 hops. The sensor data are published online via the official GreenOrbs website. The Tianmu Mountain deployment includes 200 nodes and has been in continuous operation since August 2009. The deployment area is around 200,000 square meters. The duty cycle of nodes is set at 5%. The network diameter is 20 hops.

We learned a lot of lessons during the deployment of GreenOrbs. This experiment results in several publications, including ACM Sensys 2009, 2010, ACM Sigmetrics 2010, ICNP 2010, INFOCOM 2010, etc. In this discussion, we will focus on several open issues for extremely large scale deployment of sensor networks including routing, diagnosis, localization, link quality, and etc.
Yunhao Liu received his BS degree in Automation Department from Tsinghua University, China, in 1995, and an MA degree in Beijing Foreign Studies University, China, in 1997, and an MS and a Ph.D. degree in Computer Science and Engineering at Michigan State University in 2003 and 2004, respectively. He holds the EMC Chair Professorship at Tsinghua University. He is a member of Tsinghua National Lab for Information Science and Technology, and the Director of Tsinghua National MOE Key Lab for Information Security. He is also a faculty at the Department of Computer Science and Engineering, the Hong Kong University of Science and Technology. Yunhao is now the Vice Chair of ACM China Council in charge of operation. He is also serving as the Associate Editors-in-Chief for IEEE Transactions on Parallel and Distributed Systems, and an Associate Editor for IEEE Transactions on Mobile Computing. He also serves many leading conference as TPC member, such as ACM Mobicom, ACM Mobihoc, IEEE INFOCOM, etc.
Detecting Memory Leaks Statically in Large-Scale Software

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ABSTRACT

Memory leaks are common errors affecting programs including OS kernels, desktop applications, web services and cloud applications. Many memory leaks result in serious software reliability problems. This talk will examine how to apply pointer analysis to detect memory leaks in C/C++ programs, by reviewing the state-of-the-art techniques and presenting our recent work based on full-sparse value-flow analysis and implemented fully in the Open64 compiler. I will discuss some promising results we achieved and some of the challenges we experienced.

Jingling Xue received his BSc and MSc degrees in Computer Science and Engineering from Tsinghua University in 1984 and 1987, respectively, and his PhD degree in Computer Science and Engineering from Edinburgh University in 1992. He has been on the faculties at Tsinghua University, National Technological University of Singapore and University of New England, Australia. He is currently a Professor in the School of Computer Science and Engineering, University of New South Wales, Australia, where he heads the Programming Languages and Compilers Group and also serve as Deputy Head of School.

Jingling Xue's main research interest has been programming languages and compilers for over 20 years, focusing on developing techniques relevant to high-performance computing, multicore architectures and embedded systems. He is currently supervising a group of postdocs and PhD students on a number of topics including programming and compiler techniques for multi-core processors and embedded systems, concurrent programming models, static and dynamic program analysis for bugs and security vulnerabilities, and automatic parallelisation of programs for parallel and distributed systems. His research has been supported by Intel, Sun Microsystems, Oracle and Australian Research Council. He is an Associate Editor of several international journals (including IEEE Transactions on Computers) and has served as a program chair and program committee member in a number of international conferences in his research areas. In 2013, he will be the program chair of the 2013 ACM SIGPLAN/SIGBED Languages, Compilers and Tools for Embedded Systems (LCTES), which will be held in Seattle, Washington.