Data Mining for Social Security in E-Government Services

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Extended abstract:

Social Security is a key government service for maintaining fairness and stability in any country. Due to the complexity of the services and the possibility of fraudulence, it is an ever-present problem which sometimes results in incorrect payments to beneficiaries. It is also difficult to collect debts from low-income beneficiaries which have resulted from incorrect payments. In practice, incorrect payments can be substantial, and this can impact on the perception and measurement of government performance. One possible solution for these problems is to use data mining technology to discover patterns which indicate fraud and incorrect payments, to optimise the assessment procedures and reduce the occurrence of incorrect payments.   However, mining such data provides a challenge to existing Data Mining research in areas such as unbalanced data distribution and impact-targeted pattern mining.

In this talk, I will discuss how we can develop an innovative data mining methodology (activity mining) to reduce incorrect payments by optimising the assessment procedures. I will focus on how to discover impact-targeted activity patterns in huge volumes of unbalanced activity transactions. I will also discuss issues and prospects in mining high impact activities of exceptional behaviour from rare, dispersed and imbalanced data from governmental social security datasets.

The results we have achieved so far have been verified by the domain experts and are very promising. Our experience can also be applied to other government services.

Keywords: Activity Mining, High impacted activity, Social security.

Biography:

Chengqi Zhang has been a Research Professor of Information Technology at the University of Technology, Sydney (UTS), Australia since December 2001. He is currently the Director of the UTS Priority Research Centre for Quantum Computation & Intelligent Systems (QCIS). He has also been the Chairperson of the Australian Computer Society's National Committee for Artificial Intelligence since 2005 and the Leader of the Data Mining program at the Australian Capital Market Cooperative Research Centre since 2002. Chengqi Zhang obtained his PhD degree from Queensland University in 1991 and Doctor of Science (DSc) from Deakin University in 2002.

Prof. Zhang's research interests include "Multi-Agent Systems", "Data Mining", and their integrations. He has published more than 200 research papers in these research areas. His most notable paper was published in "Artificial Intelligence" in 1992 – the most prestigious Journal in Artificial Intelligence field. He has also published many papers in first class international journals, such as IEEE and ACM Transactions. He has led his research team to attract more than $2 million in research grants from the Australian Research Council. He has been invited to present twelves keynote/invited speeches in international conferences.

Prof. Zhang has been actively serving professional communities. He has been the Associate Editor for several international journals, including IEEE Transactions on Knowledge and Data Engineering. He has been the Chair of the Steering Committee for the International Conference on Knowledge Science, Engineering, and Management since 2006   He is the Senior member of IEEE and the Fellow of ACS. He was the General Co-chair of IEEE ICDM 2010 and several other international conferences.   More detailed information can be found on his homepage at http://www-staff.it.uts.edu.au/~chengqi/