QINLONG GUO

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EDUCATION

School of Software, Tsinghua University, Beijing, China — Beijing, China
M.S., Software of Engineering Overall GPA: 90.9/100 — Aug 2012 - July 2015(Expected)
School of Software, Tsinghua University, Beijing, China — Beijing, China
B.S., Computer Software Overall GPA: 87.1/100 — Aug 2008 - July 2012

RESEARCH INTERESTS

Machine Learning, Data Mining, Business Process Management

PUBLICATION

1. **Guo, Q**., Wen, L., Wang, J., Ding, Z., & Lv, C. (2014). A Universal Significant Reference Model Set for Process Mining Evaluation Framework. In *Asia Pacific Business Process Management* (pp. 16-30). Springer International Publishing.
2. **Guo, Q**., Wen, L., Jin,T., Chen J., & Tang, W. (2014). Workflow Resource Assignment Satisfaction Judgment Based on Network-flow Method. In *proceeding of Second Conference on China Business Process Management*.
3. Gao, X., Chen, Y., Ding, Z., Wang, M., Zhang, X., Yan, Z., Wen, L., **Guo, Q.,** & Chen, R. (2014). Process Model Fragmentation, Clustering and Merging: An Empirical Study. In *Business Process Management Workshops* (pp. 405-416). Springer International Publishing.
4. Wang, J., Wong, R., Ding, J., **Guo, Q.**, & Wen, L. (2013). Efficient Selection of Process Mining Algorithms. *IEEE Transaction on Services Computing* 6(4): 484-496
5. Wang, J., Wong, R., Ding, J., **Guo, Q.**, & Wen, L. (2012). On recommendation of process mining algorithms. In *Web Services (ICWS), 2012 IEEE 19th International Conference on* (pp. 311-318). IEEE.
6. Wang, J., Tan, S., Wen, L., Wong, R., & **Guo, Q.** (2012). An empirical evaluation of process mining algorithms based on structural and behavioral similarities. In *Proceedings of the 27th Annual ACM Symposium on Applied Computing* (pp. 211-213). ACM.
7. **Guo, Q**., Wen, L., Wang, J., Yan, Z., & Yu, P. (2015) Mining process models with invisible tasks involved in non-free-choice constructs. DASFAA (**In Review**)

RESEARCH EXPERIENCE

Topic: User Behavior Burst Detection on Web-browsing — Chicago, IL
Independent Researcher, Advisor: Prof. Philip S. Yu — Jul 2014 - Current
— Big Data and Social Computing Lab, Department of Computer Science, University of Illinois at Chicago

- Background: To detect the user burst behavior on web-browsing in a given website. The input is the browsing log from the given event log.
- Modeled user behaviors as Direct Graphs by applying graph mining technique. Using Time Slices techniques, divided the input log into slices each half hour.
- Detected the burst behavior by Gaussian distribution.
- Implemented the algorithm as a prototype and case studies demonstrated that prototype managed to detect the burst.
- Currently working on refining the algorithm and try to improve the algorithm on analyzing the burst details

Topic: Process Mining Algorithm $\alpha^{\$}$ — Beijing, China
Independent Researcher, Advisor: Prof. Jianmin Wang, Prof. Lijie Wen — Sep 2013 – Sep 2014
— Institute of Information System and Engineer, School of Software, Tsinghua University

- Background: To solve the problem that no process mining algorithms can mine process models involved in two specific constructs (Invisible task and Non-free-choice Constructs) simultaneously.
- Designed $\alpha^{\$}$ mining algorithm by combining existing process mining algorithms and considering new relations between events in log.
- Implemented $\alpha^{\$}$ as plug-ins in open-source Business Process Management Tools BeehiveZ 3.5 and ProM 6.
- Conducted experiment using artificial and real-life dataset. The result showed that $\alpha^{\$}$ managed to mine the process models with these two specific structures, and improve the state-of-the-art process mining algorithms with around 30% under the mainstream process mining algorithm criteria.

Topic: A Universal Significant Reference Model Set — Beijing, China
Independent Researcher, Advisor: Prof. Jianmin Wang, Prof. Lijie Wen — Sep 2013 – Jan 2014
— Institute of Information System and Engineer, School of Software, Tsinghua University

- Background: To generalize the significant reference model set for the *Process Mining Algorithm Recommendation Framework*.
- Generalized the significant reference process model set by reviewing the mainstream challenges in Process Mining Algorithm area.
- Reduced the features that depict the process model from 48 to six by analyzing the meaning and effect of each feature.
- Conducted experiments with artificial and real-life process model datasets. The result showed that the proposed reference model set and selected features are practical and outperform the traditional ones with around 10% in accuracy.

Topic: Process Mining Algorithm Recommendation Framework — Beijing, China

Independent Researcher, Advisor: Prof. Jianmin Wang, Prof. Lijie Wen Sep 2011 – Jul 2012

— Institute of Information System and Engineer, School of Software, Tsinghua University

- Background: To reduce the time cost of traditional process mining algorithm cost: Given a model set of process model and a list of available mining algorithm, the traditional recommendation is to evaluation all the process mining algorithm against all the process model (e.g. in a large enterprise), which can be tedious and time-consuming.
- Selected a fraction of the process models from the given enterprise as reference models. Applied regression analysis to obtain trained models. Then applied the trained regression models to any process models from the enterprise and obtain the estimated result algorithms.
- Implemented this algorithm as the *Recommendation of Process Mining Algorithm* plugin in open-source Business Process Management Tools BeehiveZ 3.5.
- Conducted the experiment comparing this method with traditional method. The result showed that the time cost of recommendation was reduced as one-third, while the accuracy of recommendation remained around 90%.

Topic: Network-flow Based Workflow Staff Assignment Judgment Beijing, China

Independent Researcher, Advisor: Prof. Jianmin Wang, Prof. Lijie Wen Sep 2013 – Jan 2014

— Institute of Information System and Engineer, School of Software, Tsinghua University

- Background: To address the rationality validation of workflow staff assignment problem, which is a hot and challenging issue in Business Process Management Domain.
- Modelled the Workflow Staff Assignment Problem into a network-flow in Graph Theory.
- Proposed a mechanism based on the maximum flow techniques to judge the workflow assignment.
- Analyzed typical cases and the result indicated that proposed mechanism can address the validation problem efficiently and exactly.

Topic: Fragment based Process Configuration Tool Beijing, China

Research Assistant, Advisor: Dr. Zizhe Ding, Prof. Lijie Wen Sep 2011 – Jul 2012

— Department of Management Information System, China Mobile Communication Corporation

- Background: To generalize reusable process model fragments in 8000 process models of China Mobile Communication Corporation.
- Decomposed the process models into around 10c00 fragments by applying graph decomposing algorithm RPST.
- Implemented as the *Model Fragmentation* module of the *Fragment based Process Configuration Tool*, which has been integrated in Office Automation System in China Mobile Communication Corporation

Topic: Hot Topic Prediction Chicago, IL

Research Assistant, Advisor: Prof. Philip S. Yu Jul. 2014 – Aug. 2014

— Big Data and Social Computing Lab, Department of Computer Science, University of Illinois at Chicago

- Background: To predict the hot topic according to hot words and similarity between them.
- Clustered the hot words into topic by using spectral clustering techniques. 2000 words are clustered into 40 topics.
- Visualized the clustered result (i.e. topic) as graph by using python visualization library *matplotlib*

TEACHING EXPERIENCE

The Cloud Data Management (B), *Teaching Assistant* with Prof. Lijie Wen, Tsinghua University Fall 2014

The Concepts and Techniques of Workflows, *Teaching Assistant* with Prof. Jianmin Wang, Tsinghua University Spring 2014

Information Retrieval Technology, *Teaching Assistant* with Prof. Lijie Wen, Tsinghua University Fall 2

AWARDS

Lexiaoyao Comprehensive First Prize Scholarship, **(5/150)** Sept.2014

Guanghua Comprehensive Scholarship, (20/150) Sept.2013

Assistant Enterprise Architect, certified by The Open Group China Oct.2012

Wangwang Comprehensive Scholarship, **(5/60)** Sept.2010

Second Prize of Tsinghua University Challenge Cup Mar.2009

SELECTED PROJECTS

Echo System

- A sound-based android App which includes analysis, processing and sound message.
- In charge of back-end developing: Designed the database schema, and developed the server-api.
- Funded by School of Software Student Training Program, (around 10 project each year in School of Software)

Viva City

- A Client-Server application which imitated real-life scenes such as scenes in apartment, scenes in street and so on.
- Developed the *Compression and Decompression* module in internet transportation between client and server
- Funded by School of Software Student Training Program , (around 10 project each year in School of Software)

KELI:

- An android app which shares course information in Tsinghua University.
- In charge of back-end developing: Designed the database schema, and developed the server-api.

SKILLS

Programming: Java, C/C++, Matlab, Python, PHP, SQL