Jin Guo

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Research Interests

Software Engineering, Software Traceability, Requirements Satisfaction Analysis, Natural Language Processing, Deep Learning

Education

05/2017(Expected) **University of Notre Dame**, Notre Dame, USA
Ph.D. Candidate in Computer Science and Engineering

Advisor: Dr. Jane Cleland Huang
Dissertation: Semantically Enhanced Software Traceability
Committee: Collin McMillan, David Chiang, Jane Hayes (University of Kentucky)

06/2009 **Xian Jiaotong University**, Xi'an, China
M.S. in Information and Communication Engineering

06/2006 **Xian Jiaotong University**, Xi'an, China
B.S. in Information Engineering

Employment Experience

07/2016 - Present **Research Assistant**, University of Notre Dame, Notre Dame, USA

- *Semantically Enhanced Software Traceability Using Deep Learning Techniques*: designed a tracing network architecture that utilized Word Embedding and Recurrent Neural Network (RNN) to extract and compare semantic information from software artifacts for the purpose of software trace link generation.

01/2013 - 06/2016 **Research Assistant**, DePaul University, Chicago, USA

- *Domain Knowledge Mining*: designed and implemented a knowledge mining approach that leveraged trace links in software intensive systems to guide the process of extracting domain facts for supporting software engineering tasks.
- *Intelligent Domain-Specific Traceability*: designed and implemented solutions for accurate trace links creation between software artifacts and generated the underlying rationales explaining those links utilizing natural language processing and knowledge representation techniques.

06/2009 - 07/2011 **Researcher**, Communication Technology Lab, Fuji Xerox, Yokohama, Japan

- *SkyDesk collaboration service*: designed and implemented image processing algorithms to extract and correct business card and whiteboard regions from images with complex backgrounds.
- *Image comparison*: designed and implemented a fuzzy image comparing algorithm for the purpose of printer software testing.

10/2007 - 07/2008 **Visiting Research Fellow**, Communication Technology Lab, Fuji Xerox, Nakai, Japan

- *Sensing UI*: participated in designing and implementing a novel human-computer interface based on 3D tracking technologies and took charge of the image processing module.

Teaching/Mentoring Experience

Guest Lecturer — Coordinated series of debates on *Ethics in Drone Use*
CSE-40773: Software Projects with Drones, University of Notre Dame. (Fall, 2016)

Guest Lecturer — Lectured on *Design Patterns* and *JavaFX* tool, Organized Lab Activities
SE350: Object-Oriented Software Development, DePaul University. (Spring, 2016)

Invited Speaker — *Ontology Learning for Software-Intensive Projects*
CSC 480: Artificial Intelligence, DePaul University. (Spring, 2016)

Invited Speaker — *Towards an Intelligent Domain-Specific Traceability Solution*
CSC 395: Research Colloquium, DePaul University. (Fall, 2014)

Project Mentor — Managed and mentored two graduate students who served as research assistants on software engineering research projects, DePaul University. (2013-2014)

Invited Speaker — *The Domain-Specific Expert Traceability System*
CSC 395: Research Colloquium, DePaul University. (Fall, 2013)

Co-Instructor — Lectured on *Image Processing and Pattern Recognition*
Internal Tutorial, Fuji Xerox. (Fall, 2009)

Publication

Journal Articles — **Guo, J.**, Gibiec, M., and Cleland-Huang, J. "Tackling the term-mismatch problem in automated trace retrieval". In: *Empirical Software Engineering* (2016), pp. 1–40. DOI: 10.1007/s10664-016-9479-8

Conference — **Guo, J.**, Cheng, J., and Cleland-Huang, J. "Semantically Enhanced Software Traceability Using Deep Learning Techniques". **Submitted to**: *the 38th International Conference on Software Engineering, ICSE 2017*

Guo, J., Rahimi, M., Cleland-Huang, J., Rasin, A., Hayes, J. H., and Vierhauser, M. "Cold-start software analytics". In: *Proceedings of the 13th International Conference on Mining Software Repositories, MSR 2016, Austin, TX, USA, May 14-22, 2016*, pp. 142–153. (Acceptance rate: 27%)

Cheng, J., Anderson, D. C., Putnam, C., and **Guo, J.** "GaPBIT: Leveraging Design Patterns to Support Design of Brain Injury Therapy Games". **Submitted to**: *the 2017 CHI Conference on Human Factors in Computing Systems*

Cheng, J., Putnam, C., and **Guo, J.** ""Always a Tall Order": Values and Practices of Professional Game Designers of Serious Games for Health". In: *Proceedings of the 2016 Annual Symposium on Computer-Human Interaction in Play*. CHI PLAY '16. (Acceptance rate: 29%)

Guo, J., Monaikul, N., Plepel, C., and Cleland-Huang, J. "Towards an intelligent domain-specific traceability solution". In: *ACM/IEEE International Conference on Automated Software Engineering, ASE '14, Vasteras, Sweden, September 15-19, 2014*, pp. 755–766. (Acceptance rate: 20%)

Guo, J., Cleland-Huang, J., and Berenbach, B. "Foundations for an expert system in domain-specific traceability". In: *21st IEEE International Requirements Engineering Conference, RE 2013, Rio de Janeiro-RJ, Brazil, July 15-19, 2013*, pp. 42–51. (Acceptance rate: 18%)

Short Papers & Workshops

Guo, J. and Cleland-Huang, J. "Augmenting Natural Language Analysis with Trace Links to Mine Domain Facts from Software Requirements". In: *Workshop on the Naturalness of Software, Seattle, USA, Nov 13, 2016*

Cleland-Huang, J., **Guo, J.**, Monaikul, N., Lohar, S., Goss, W., and Rasin, A. "Using Natural Language Processing to Translate Software Project Queries into Structured Form". In: *Workshop on the Naturalness of Software, Seattle, USA, Nov 13, 2016*

Guo, J. "Ontology learning and its application in software-intensive projects". In: *Proceedings of the 38th International Conference on Software Engineering, ICSE 2016, Austin, TX, USA, May 14-22, 2016 - Companion Volume*, pp. 843–846

Guo, J., Monaikul, N., and Cleland-Huang, J. "Trace links explained: An automated approach for generating rationales". In: *23rd IEEE International Requirements Engineering Conference, RE 2015, Ottawa, ON, Canada, August 24-28, 2015*, pp. 202–207

Cleland-Huang, J. and **Guo, J.** "Towards more intelligent trace retrieval algorithms". In: *3rd International Workshop on Realizing Artificial Intelligence Synergies in Software Engineering, RAISE 2014, Hyderabad, India, June 3, 2014*, pp. 1–6

Non-Refereed Publications

Guo, J., Monaikul, N., and Cleland-Huang, J. "Trace-Links – A Novel Data Source for Ontology Generation in Software Intensive Projects". In: *DePaul University School Of Computing Research Symposium, SOCRS 2015, Chicago, IL, USA, May 29, 2015*, pp. 1–2

Guo, J. and Cleland-Huang, J. "Foundations for an Expert System in Domain Specific Traceability". In: *DePaul University School Of Computing Research Symposium, SOCRS 2013, Chicago, IL, USA, May 31, 2013*, p. 35

Guo, J. "Research on Feature Object 3D Reconstruction Based on Monocular Vision". *Master Thesis*, Xi'an Jiaotong Univeristy, Xi'an, China. *2009*

Patents Issued

Guo, J. and Onishi, T. "Subject region detecting apparatus". Pat. 8,805,077. Aug. 12, 2014

Guo, J. and Onishi, T. "Image processing apparatus, image processing method, and computer readable medium". Pat. 8,923,610. Dec. 30, 2014

Activities and Service

Co-Organizer

The 1st, 2nd, and 3rd International Workshop on Artificial Intelligence for Requirements Engineering (AIRE). 2014–2016

Prog. Committee

The 25th International Requirement Engineering Conference (RE) Data Track. 2017

The 5th International Workshop on Realizing Artificial Intelligence Synergies in Software Engineering (RAISE). 2016

The 8th International Symposium on Software and Systems Traceability (SST). 2015

Stud. Volunteer

FSE'16, RE'15, KDD'13, RE'12

Honors and Scholarship

2016	*NSF Travel Fund*, Workshop on the Naturalness of Software
2013 – 2015	*Summer Research Fund*, DePaul University
2013	*Ready-Set-Transfer Award*, 21st IEEE International Requirements Engineering Conference
07/2011	*Chief Minister's Research Award*, Fuji Xerox
11/2005	*Siyuan Scholarship*, Xi'an Jiaotong University
2002 – 2006	*Innovation Fund*, Xi'an Jiaotong University