

# SUGANDHA MALVIYA

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## RESEARCH AND TEACHING INTERESTS

Software Engineering | Database Management System | Data Science and Analytics | Machine Learning

## CERTIFICATIONS

**04/2022**                    **Data Science and Machine Learning: Making Data-Driven Decisions**  
Massachusetts Institute of Technology IDSS

## EDUCATION

**08/2018**                    **Ph.D. in Computer and Information Sciences**

DePaul University, Chicago, IL, USA

Advisor: Prof. Jane Cleland-Huang and Prof. Alexander Rasin

**08/2010**                    **Masters of Engineering in Computer Science and Engineering (Gold Medal)**

Thapar University, Patiala, PB, India

**05/2006**                    **Bachelors of Engineering in Information Technology (Honors)**

University of Rajasthan, RJ, India

## PROFESSIONAL EXPERIENCE

**2022 - Present**                    **Assistant Teaching Professor,**

*Ball State University, Muncie, IN, USA*

- Courses taught: CS203: Introduction to Computer Security, CS410: Web Programming, and CS418: Database Design.
- Secretary, Colloquium and Students Events Committee.

**2018 - 2019**                    **Visiting Assistant Professor,**

*Indiana University Purdue University Indianapolis, Indianapolis, IN, USA*

- Responsible for conducting research, writing grant proposals and teaching graduate and undergraduate level database and software engineering courses.
- Courses Taught “CSCI50700-Object Oriented Design and Programming” a graduate level course and “CSCI44300-Database Systems” an undergraduate level course in spring 2019.

**2013 - 2017**                    **Graduate Research Assistant, DePaul University, Chicago, IL, USA**

- Worked on multiple software engineering research projects, predominantly focusing on developing novel techniques for effective utilization of traceability links through the use of real-world project queries.
  - *Traceability Queries and Strategies for Requirements Engineers:* Designed and conducted usability studies to learn the information needs of a requirements engineer and business analysts, analyzed gathered information to create query models outlining project strategies for supporting requirements related tasks.

- *TiQi – A Natural Language Interface for Software Projects*: Conceptualized an initial level query domain model, designed experiments to evaluate early prototype, investigated different query techniques and visualization strategies through a series of empirical study, including a study using an eye tracker device and designed interface to communicate a controlled natural language query.
- *Towards Trace Link Optimization*: Applied machine learning technique and developed a novel approach to improve the quality of trace links by dynamically configuring the underlying infrastructure. Evaluated the approach through a set of experiments using datasets from the transportation, healthcare, and space exploration domains.
- Collaborated with both academic and industry researchers on different projects.
- Published a journal article and many peer-reviewed papers in top requirements engineering conferences and workshops.
- Presented research in team meetings, seminars and international conferences.
- Co-advised graduate, undergraduate students on different projects.

**2008 - 2010**

**Teaching Assistant**, *Thapar University, Patiala, PB, India*

- Organized programming workshops for students from multiple backgrounds.
- Assumed accountability in managing lab sessions, grading assignments, and assisting professors with course material.

**2007 - 2008**

**Lecturer**, *Jodhpur Institute of Engineering and Technology, Jodhpur, RJ, India*

- *Courses taught*: Object Oriented Programming, Database Management System.
- Worked closely with students on the course materials, assignments, class project, and exams.

**2006 - 2007**

**Junior Research Fellow**, *International Centre for Radio Science, RJ, India*

- Handled projects utilizing satellite data for the purpose of Remote Sensing and Data Processing. The satellite data were obtained from Space Application Centre, Indian Space Research Organization (ISRO), Ahmedabad, GJ, India.
- Developed software to process satellite data and produce images showing the recorded brightness temperature at specific geographical locations.
- The images were used to study geophysical properties of Himalaya's ice and for the demarcation of land-water boundary of the Indian Coastal region.

## AWARDS AND HONORS

**2017**

**Best Tool Paper Award**, Automated Software Engineering Conference.

**2013 - 2017**

**Summer Research Fund**, DePaul University.

**2017**

**NSF Travel Fund**, Grand Challenge of Traceability Workshops.

**2010**

**University Medal** for securing highest Cumulative GPA, Thapar University.

**2008 - 2010**

**Graduate Aptitude Test Engineering (GATE) Scholarship**, Government of India

## PUBLICATION

### Journal

Pruski, P., **Lohar, S.**, Goss, W., Rasin, A., & Cleland-Huang, J. (2015). TiQi: answering unstructured natural language trace queries. *Requirements Engineering*, 20(3), 215-232.

### Conference

Liu, Y., Lin, J., Cleland-Huang, J., Vierhauser, M., Guo, J., & **Lohar, S.**, (2020, September). SENET: A Semantic Web for Supporting Automation of Software Engineering Tasks. In *2020 IEEE Seventh International Workshop on Artificial Intelligence for Requirements Engineering (AIRE)* (pp. 23-32). IEEE.

Lin, J., Liu, Y., Guo, J., Cleland-Huang, J., Goss, W., Liu, W., **Lohar, S.**, Monaikul, N., & Rasin, A. (2017, October). TiQi: a natural language interface for querying software project data. In *Proceedings of the 32nd IEEE/ACM International Conference on Automated Software Engineering* (pp. 973-977). IEEE.

**Malviya, S.**, Vierhauser, M., Cleland-Huang, J., & Ghaisas, S. (2017, September). What Questions do Requirements Engineers Ask? In *Requirements Engineering Conference (RE), 2017 IEEE 25th International* (pp. 100-109). IEEE.

**Lohar, S.**, Cleland-Huang, J., & Rasin, A. (2016, March). Evaluating the interpretation of natural language trace queries. In *International Working Conference on Requirements Engineering: Foundation for Software Quality* (pp. 85-101). Springer, Cham.

Pruski, P., **Lohar, S.**, Aquanette, R., Ott, G., Amornborvornwong, S., Rasin, A., & Cleland-Huang, J. (2014, August). Tiqi: Towards natural language trace queries. In *Requirements Engineering Conference (RE), 2014 IEEE 22nd International* (pp. 123-132). IEEE.

**Lohar, S.**, Amornborvornwong, S., Zisman, A., & Cleland-Huang, J. (2013, August). Improving trace accuracy through data-driven configuration and composition of tracing features. In *Proceedings of the 2013 9th Joint Meeting on Foundations of Software Engineering* (pp. 378-388). ACM.

Calla, O. P. N., & **Lohar, S.** (2007, July). Study of Himalayas Ice using MSMR Data. In *Geoscience and Remote Sensing Symposium, 2007. IGARSS 2007. IEEE International* (pp. 4001-4004). IEEE.

### Workshops

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

**Lohar, S.** (2016). Supporting Natural Language Queries across the Requirements Engineering Process. In *REFSQ Workshops*.

**Lohar, S.**, Cleland-Huang, J., Rasin, A., & Mäder, P. (2015, March). Live Study Proposal: Collecting Natural Language Trace Queries. In *REFSQ Workshops* (pp. 207-210).

### Non-Refereed Publications

**Malviya, S.**, Cleland-Huang, J. & Rasin, A. (2017, May). Collecting and Analyzing Requirements Related Software Project Queries. In: *DePaul University School of Computing Research Symposium, SOCRS 2017, Chicago IL, USA*.

**Malviya, S.**, Vierhauser, M., & Cleland-Huang, J. (2017, March). Traceability Queries and Strategies for the Requirements Engineering Domain. In: *Grand Challenges of Traceability: The Next Ten Years*, Lexington, Kentucky, USA.

**Lohar, S.**, Cleland-Huang, J., & Rasin, A. (2015, May). User Evaluation of Traceability Query Representation. In *DePaul University, SOCRS 2015, Chicago IL, USA*.

**Lohar, S.**, Amornborvornwong & Cleland-Huang, J. (2013, May). Improving Trace Accuracy through Data Driven Configuration and Composition of Tracing Features. In: *DePaul University, SOCRS 2013, Chicago IL, USA*.

## ACTIVITIES AND SERVICE

- **Invited Speaker**, Using Project Queries to Plan Project Infrastructure for Business Analysts, Indiana University Purdue University at Indianapolis. (Spring 2019)
- **Invited Speaker**, Analyzing Real-World Queries to Support Requirements Engineering Tasks. Research Colloquium, DePaul University. (Fall, 2017).
- **Invited Speaker**, TraceLab: A Visual Modeling and Execution Environment for Empirical Software Engineering Research, Research Colloquium, DePaul University. (Fall, 2013).
- **Invited Speaker**, Technical Session on Remote Sensing and Data Processing, International Conference on Radio Science ICRS, India, 2008.
- **Student Volunteer**, 20th Institute of Electrical and Electronics Engineers (IEEE) International RE Conference 2013.
- **Member, Event Management Committee**, Institute of Electrical and Electronics Engineers (IEEE) International Advance Computing Conference (IACC) 2009.
- **Joint Secretary & Workshop Committee Member**, Creative Computing Society, Thapar University.
- **Rapporteur** of the technical session on “Microstrip Antenna and Processing” at the 5th International conference on Microwaves, Antenna, Propagation and Remote Sensing (ICMARS) 2009.
- **Instructor**, Introduction to Programming Workshop, Creative Computing Society, Thapar University