Varish Mulwad

http://varish.net • http://www.linkedin.com/in/varish

Summary

My research interests and projects have broadly focused on extracting information and adding semantics to unstructured or semi-structured data by applying techniques from The Semantic Web, Natural Language Processing (NLP) and Machine Learning

Skills

- Programming Languages:Java, C#, Python.
- Tools and Technologies: Eclipse, Microsoft Visual Studio, IntelliJ, SQL Server, mongoDB.
- Semantic Web Tools and Technologies: RDF, OWL, SPARQL, Protege, SADL, SemTK.

Education

Ph.D. in Computer Science, University of Maryland, Baltimore County, Spring 2015
CGPA – 3.67 out of 4.0; **Advisor** – Dr. Tim Finin

Ph.D. Dissertation Research: *TABEL* – A domain independent and extensible framework for inferring the semantics of tables and representing them as RDF Linked Data • Joint inference of semantics using a probabilistic graphical model • Developed a novel *Semantic Message Passing* technique for inference • Evaluation over web tables and medical tables • More: `http://ebiq.org/j/96`

Dissertation Committee – Drs. Tim Finin, Anupam Joshi, Tim Oates, Yun Peng (UMBC), Drs. L V Subramaniam, Indrajit Bhattacharya (IBM Research, India)

Masters of Science in Computer Science, University of Maryland, Baltimore County, August 2010
CGPA – 3.75 out of 4.0; **Advisor** – Dr. Tim Finin
Thesis – *T2LD* – An automatic framework for extracting, interpreting and representing tables as linked data; Thesis Committee – Drs. Tim Finin, Anupam Joshi, Tim Oates (UMBC), Dr. Evelyne Viegas (Microsoft Research)

Bachelor of Engineering in Computer Science and Engineering, University of Mumbai, December 2007, **Final Year Project**: *The Interview Scheduler* – A web based application for scheduling interviews.

Work History

GE Research (March 2018 – present)
Lead Scientist (Location: Niskayuna, NY, USA)

- Developing NLP algorithms for extraction of scientific concepts and equations from text as part of DAPRA's Automating Scientific Knowledge Extraction program.
- Leading a research collaboration with UMBC for learning to extract relations from text with limited examples (form of learning with less labels).
- Lead researcher and developer for an internal NLP framework used in several projects.
- Authoring govt. research proposals as Principal Investigator and key contributor.

GE Research (August 2015 – March 2018)
Knowledge Discovery Researcher (Location: Niskayuna, NY, USA)

- Led the development of an AI agent for IT Tech agents - AI assists in classifying IT tickets into categories, recommends possible resolutions for new problems and recommends experts that can assist in resolving new issues. The AI agent is deployed in production and is used by GE's IT tech agents.
- Part of the team that developed NLP algorithms for concept extraction from medical documents and recommendation of relevant document from patient history to radiologists; Led the transition of algorithms into GE Healthcare's medical imaging software product.

Ebiquity Research Lab, UMBC (April 2015 – July 2015)
Post–doctoral Research Associate (Location: Baltimore, MD, USA)

- Projects: Text analysis of Social Media data & Automatic Interpretation of Log Files to support Cybersecurity.

Ebiquity Research Lab, UMBC (Sep. 2009 – Mar. 2015)
Research Assistant (Location: Baltimore, MD, USA)

- Research projects: 1) Extracting concepts describing security vulnerabilities from text; 2) Infoboxer: Using Statistical and Semantic Knowledge to Help Creating Wikipedia Infoboxes.
- Gained experience in writing grant proposals by contributing to govt. and industry proposals.

Microsoft Research (May 2012 – August 2012)
Research Intern (Location: Redmond, WA, USA)

- Project focused on information extraction from text descriptions associated with apps in the Windows Phone Store. Mentor: Dr. Evelyne Viegas. US patent 9558275 issued based on internship work.

Microsoft Bing (June 2011 – August 2011)
Software Development Engineer Intern (Location: Bellevue, WA, USA)

- Developed a prototype to demonstrate the use of entity disambiguation to improve search results.
- Two disclosures filed with Microsoft for patent consideration.

Symantec Corporation (May 2009 – Aug. 2009)
Intern (Location: Columbia, MD, USA)

- Acquired knowledge of Symantec's internal IPC tool and provided inputs to the design team.
- Developed a tool for automated testing of the SEPEX Proxy DLL.
- Proposed a design of a more generic automated test tool to test any given DLL.

Ness Technologies India (Jan. 2008 – June 2008)
Intern (Project Trainee) (Location: Mumbai, MH, India)

- Prepared and presented a Test–Automation prototype for a Ness client.
- Developed an application independent Test–Automation framework.

Mastek India (June 2006 – March 2007)
Final year undergraduate project (Location: Mumbai, MH, India)

- Developed "The Interview Scheduler" – a web based application used by the Human Resource department to schedule interviews between candidates and interviewers. Project website: `http://www.projecttis.co.nr`

Publications [1]

Total citations: 405 • h–index: 9 • i10–index: 9 [as of Mar. 2019]

Book Chapters

- **Varish Mulwad**, Tim Finin and Anupam Joshi, "A Domain Independent Framework for Extracting Linked Semantic Data from Tables", In Search Computing, ISBN 978-3-642-34212-7, vol. 7538, 2012.

Conferences

- Justin McHugh, Paul Cuddihy, Jenny Williams, Kareem Aggour, Vijay Kumar, and **Varish Mulwad**, "Integrated Access to Big Data Polystores through a Knowledge-driven Framework", IEEE Int. Conf. on Big Data, Boston, MA, USA, 2017.
- Sudip Mittal, Prajit Kumar Das, **Varish Mulwad**, Anupam Joshi, and Tim Finin, "CyberTwitter: Using Twitter to generate alerts for cybersecurity threats and vulnerabilities", In 2016 IEEE/ACM Int. Conf. on Advances in Social Networks Analysis and Mining (ASONAM), San Francisco, CA, USA, 2016.
- Piyush Nimbalkar, **Varish Mulwad**, Nikhil Puranik, Anupam Joshi, and Tim Finin, "Semantic Interpretation of Structured Log Files", In 17th IEEE Int. Conf. on Information Reuse and Integration (IRI), Pittsburgh, PA, USA, 2016.
- **Varish Mulwad**, Tim Finin and Anupam Joshi, "Interpreting Medical Tables as Linked Data to Generate Meta–Analysis Reports", In 15th IEEE Int. Conf. on Information Reuse and Integration (IRI 2014), San Francisco, CA, USA, 2014.
- **Varish Mulwad**, Tim Finin and Anupam Joshi, "Semantic Message Passing for Generating Linked Data from Tables", In 12th Int. Semantic Web Conf. (ISWC 2013), Sydney, Australia, 2013.
- Zareen Syed, Tim Finin, **Varish Mulwad**, and Anupam Joshi, "Exploiting a Web of Semantic Data for Interpreting Tables", In 2nd Web Science Conf. (WebSci 2010), Raleigh, NC, USA, 2010.

Doctoral Consortium

- **Varish Mulwad**, "DC Proposal: Graphical Models and Probabilistic Reasoning for Generating Linked Data from Tables", In 10th Int. Semantic Web Conf. (ISWC 2011), Bonn, Germany, 2011.

[1] available for download at `http://ebiq.org/h/Varish/Mulwad`; citation data available here: `http://goo.gl/S2fJc`

Workshops

- Luis Tari, **Varish Mulwad**, Anna von Reden, "Interactive online learning for clinical entity recognition", In Proceedings of the Workshop on Human-In-the-Loop Data Analytics (HILDA '16), held at SIGMOD, San Francisco, CA, 2016
- **Varish Mulwad**, Tim Finin and Anupam Joshi, "Automatically Generating Government Linked Data from Tables", In AAAI Fall Symposium on Open Government Knowledge: AI Opportunities and Challenges (OGK 2011), Arlington, VA, USA, 2011.
- **Varish Mulwad**, Tim Finin and Anupam Joshi, "Generating Linked Data by Inferring the Semantics of Tables", In 1st Int. Workshop on Searching and Integrating New Web Data Sources (VLDS 2011), held at 37th Int. Conf. on Very Large Databases (VLDB 2011), Seattle, WA, USA, 2011.
- **Varish Mulwad**, Wenjia Li, Anupam Joshi, Tim Finin and Krishnamurthy Viswanathan, "Extracting Information about Security Vulnerabilities from Web Text", In Web Intelligence for Information Security Workshop, held at IEEE/WIC/ACM Int. Conf. on Intelligent Agent Technology (WI–IAT 2011), Lyon, France, 2011.
- **Varish Mulwad**, Tim Finin, Zareen Syed and Anupam Joshi, "Using linked data to interpret tables", In 1st Int. Workshop on Consuming Linked Data, held at the 9th Int. Semantic Web Conf. (ISWC 2010), Shanghai, China, 2010.

Poster and Demos

- Paul Cuddihy, Justin McHugh, Jenny Weisenberg Williams, **Varish Mulwad**, Kareem S. Aggour, "SemTK: A Semantics Toolkit for User-friendly SPARQL Generation and Semantic Data Management", In 17th Int. Semantic Web Conf. (ISWC 2018), Monterey, CA, USA, 2018.
- Roberto Yus, **Varish Mulwad**, Tim Finin, and Eduardo Mena, "Infoboxer: Using Statistical and Semantic Knowledge to Help Create Wikipedia Infoboxes", In 13th Int. Semantic Web Conf. (ISWC 2014), Riva del Garda, Italy, 2014.
- **Varish Mulwad**, Tim Finin, Zareen Syed and Anupam Joshi, "T2LD: Interpreting and Representing Tables as Linked Data" In 9th Int. Semantic Web Conf. (ISWC 2010), Shanghai, China, 2010.

Patents

Granted

- Luis Tari, **Varish Mulwad**, "System and Method for Entity Recognition and Linking", United States Patent 10,146,859, 2018.
- Anna Von Reden, **Varish Mulwad**, Eric Fluharty, Ethan Winograd, Tao Jing, "Display Screen or Portion Thereof with Graphical User Interface", United States Patent D821,423, 2018.
- Evelyne Viegas, **Varish Mulwad**, Patrick Pantel, "Action Broker", United States Patent 9,558,275, 2017.

Filed

- **Varish Mulwad**, Ivan Bueno, Raghava Mutharaju, "Apparatus, System and Method for Providing an Agent That Intelligently Solves Information Technology Issues", United States Patent Application, 2018
- **Varish Mulwad**, Kareem Aggour, "Systems and Methods for Learning to Extract Relations from Text via User Feedback", United States Patent Application, 2017.
- S.M. Gustafson, K.S. Aggour, A. Gabaldon Royval, **V. Mulwad**, "Methods and Systems for Programatically Selecting Predective Model Parameters", United States Patent Application, 2016.

Grant Proposals

- Significant contributions to the National Science Foundation (NSF) proposal "EAGER: T2K: From Tables to Knowledge"; **awarded ($200,000)**; PI – Dr. Anupam Joshi; CO–PI – Dr. Tim Finin.
- Significant contributions to FFRDC Seed Grant proposal, "Supporting Situation-Aware Systems for Automated Information Sharing and Incident Response"; **awarded ($50,000)**; PI – Dr. Zareen Syed (UMBC)

Professional Academic Activities

- Co-organizer, "Knowledge Graph Technology and Applications" workshop at the Web Conf. 2019
- Co-organizer, "Industrial Knowledge Graphs" workshop at the ACM Web Science Conf. 2017
- President, UMBC ACM student chapter (2012 – 2013).

- **Program Committee Member**
  - 57th Annual Meeting of the Association for Computational Linguistics [Social Media Area] (ACL 2019)
  - 28th Int. Joint Conf. on Artificial Intelligence (IJCAI 2019)
  - Poster & Demo track for Int. Semantic Web Conf. (2016, 2017, 2018, 2019)
  - Poster & Demo track for Extended Semantic Web Conf. (2017, 2018, 2019)
  - Int. Workshop on Natural Language Interfaces for Web of Data (NLIWoD 2018)
  - Workshop on Knowledge Base Construction, Reasoning and Mining (2018)
  - In-Use Track for Int. Semantic Web Conf. (2017)
  - Int. Workshop on Linked Data for Information Extraction (2014, 2015, 2016, 2017).
  - 28th AAAI Conf. on Artificial Intelligence (AAAI 2014).
  - 2nd Mid–Atlantic Student Colloquium on Speech, Language and Learning (MASC–SLL 2012).
  - 1st Int. Workshop on Knowledge Discovery and Data Mining Meets Linked Open Data (Know@LOD 2012 at ESWC 2012).
- **Reviewer**
  - External reviewer ACM conference for Human-Computer Interaction (CHI 2016).
  - Sub reviewer 30th AAAI Conf. on Artificial Intelligence (AAAI 2016).
  - ACM Transactions on the Web (TWEB) (2014).
  - IEEE Transactions on Knowledge and Data Engineering (TKDE) (2013).
  - The VLDB journal's special issue on Structured,Social and Crowd-sourced Data (VLDBJ) (2012).
  - IEEE Intelligent Systems special issue on Linked Open Government Data (2011).

Honors and Awards

- Strategic Initiative Award, GE Global Research (2015)
- Above & Beyond Bronze Award, GE Global Research (2015)
- NSF awards for travel to the 13th (2014), 12th (2013), 10th (2011) and 9th (2010) Int. Semantic Web Conf.
- Best PhD research award, UMBC CSEE department's annual research review meet (2013).
- First place (2012) and Third place (2011), Poster presentation competition, UMBC CSEE department's annual research review.
- Outstanding Oral Presentation award, 33rd (2011), 32nd (2010) UMBC Graduate Research Conf.
- Spot award in Ness Technologies for successful client demo of test automation prototype (2008).
- Felicitated by Mastek CMD for the successful implementation of The Interview Scheduler Project (2007).
- Selected as Best Student in the Computer Engineering Batch at the Atharva College of Engineering, University of Mumbai (2006 – 2007).
- Second in School at the Secondary School Exams (2001).