

Kalpa Gunaratna

Ph.D. Candidate in Computer Science

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Research Interests: *Summarization, ML/IR/AI Techniques for Data Analytics, NLP, Data Integration and Alignment, Linked Data, Semantic/Cognitive Computing, and Knowledge Representation and Semantic Web Technologies.*

Education

Kno.e.sis Center, Wright State University

Ph.D. in Computer Science

Dayton, OH

2010 June - present

- Dissertation title: *Concise and Comprehensive Summarization of Structured Data on the Web*

University of Colombo

B.Sc. Computer Science, First Class Honors

Colombo, Sri Lanka

2004 - 2008

Research

- *FACES project, 2014 - present:*
 - Using incremental hierarchical conceptual clustering to generate concise and comprehensive entity summaries.
 - Enriching knowledge graphs with type semantics using Natural Language Processing techniques.
 - Keywords: Knowledge Graphs, Semantic Web, Linked Data, NLP, Information Retrieval, Unsupervised Learning
- *PW11 project (Pratt & Whitney + Air Force Research Lab), 2014:*
 - Development of access control and data sharing platform using Semantic Web and knowledge representation techniques (lead investigator).
 - Keywords: Semantic Web, Access Control and Sharing
- *Materials project (Air Force Research Lab), 2013:*
 - Application of Linked Data and Semantic Web technologies for the Materials Science domain (President Obama's Material Genome Initiative). Initiated and provided expertise on development of domain vocabulary.
 - Automatic exploration of metal binding interactions from text using NLP (group leader).
 - Keywords: Semantic Web, Linked Data, NLP, Domain Vocabulary
- *ESQuILO project (NSF), 2011 - 2012:*
 - Relationship identification and alignment in Linked Open Data. Partial and causal relationship analysis. Ontology alignment techniques for Linked Open Data.
 - Investigation of knowledge available on the Web (Wikipedia) for alignment tasks.
 - Keywords: Semantic Web, Linked Data, Statistical Analysis
- *Hadoop project, 2010:*
 - Map-Reduce and specialized tools for large scale NMR data processing.
 - Keywords: Distributed Computing, Hadoop, Matlab, Domain Specific Languages
- *Undergraduate research project, 2008:*
 - Image processing and supervised deep learning (pattern recognition) techniques to detect currency notes.
 - Keywords: Deep Learning, Image Processing, Neural Networks

Experience and Awards

Professional Experience

- Graduate Research Assistant (June, 2010 - present) : At Kno.e.sis Center, Wright State University.
- Teaching Assistant (September 2015 - present) : At Department of Computer Science and Engineering, Wright State University (Advanced Algorithms & Design).
- Research Intern (June - August, 2015): At IBM Almaden Research Center, USA under supervision of Dr. Hamid Motahari (manager: Dr. Taiga Nakamura). Developed intelligent cognitive assistant for work environment using adaptive online learning techniques. US patent filed, January 2016.
- Research Intern (May - August, 2014): At National Library of Medicine (NLM), USA under supervision of Dr. Olivier Bodenreider. Investigated use of predication similarity for document retrieval utilizing knowledge graphs.

- Research Intern (January - May, 2013): At Insight Center, Ireland under supervision of Dr. Edward Curry. Researched on semantic matching of heterogeneous events.
- Teaching Assistant (September 2010 - May 2011): At Department of Computer Science and Engineering, Wright State University (Introduction to Programming).
- Software Engineer (September 2008 - June 2010): At CodeGen International (Pvt) Ltd (UK based). Development of real world commercial applications in travel industry and R&D work in product improvement. Client site visits to train employees.
- Industrial Trainee (January 2007 - June 2007): At Virtusa Corp. (Pvt) Ltd, Sri Lanka. Worked in R&D department and IBM Mozart project for development of custom graphical components.

Awards and Recognition

- Runner up prize winner of IBM Blockchain Hackathon at IBM Almaden Research Center 2015.
- AAAI travel grant 2015.
- Professional development grant from Wright State Graduate Students' Assembly 2015.
- NEWS highlight in international center at Wright State University 2015.
- National Best Quality Software Awards (NBQSA - Sri Lanka) finalist for undergraduate research project 2008.
- Second place in Blazing Innovation 2006 for Microsoft Imagine Cup organized by UCSC.

Publications

- [1] **Gunaratna, K.**, Thirunarayan, K., Sheth, A., & Cheng, G. (2016). Gleaning Types for Literals in RDF Triples with Application to Entity Summarization. 13th Extended Semantic Web Conference (ESWC), 2016 (accepted).
- [2] **Gunaratna, K.**, Thirunarayan, K., & Sheth, A. (2015). FACES: Diversity-Aware Entity Summarization using Incremental Hierarchical Conceptual Clustering. 29th AAAI Conference on Artificial Intelligence (AAAI 2015), AAAI, 2015.
- [3] **Gunaratna, K.**, Lalithsena, S., & Sheth, A. (2014). Alignment and Dataset Identification of Linked Data in Semantic Web. Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery 4, no. 2 (2014): 139-151. DOI=10.1002/widm.1121
- [4] **Gunaratna, K.** (2014). Document Retrieval using Predication Similarity. Lister Hill National Center for Biomedical Communications, National Library of Medicine; 2014 (Technical Report).
- [5] **Gunaratna, K.**, Thirunarayan, K., Jain, P., Sheth, A., & Wijeratne, S. (2013, September). A statistical and schema independent approach to identify equivalent properties on linked data. In Proceedings of the 9th International Conference on Semantic Systems (pp. 33-40). ACM. DOI=10.1145/2506182.2506187
- [6] **Gunaratna, K.**, Thirunarayan, K., & Sheth, A. (2013). Types of Property Pairs and Alignment on Linked Datasets A Preliminary Analysis. Proceedings of the I-SEMANTICS 2013 Posters & Demonstrations Track, 35.
- [7] Hasan, S., **Gunaratna, K.**, Qin, Y., & Curry, E. (2013). Demo: Approximate Semantic Matching in the COLLIDER Event Processing Engine. In Proceedings of the 7th ACM international conference on Distributed event-based systems (DEBS '13). ACM. DOI=10.1145/2488222.2489277
- [8] **Gunaratna, K.**, Anderson, P., Ranabahu, A., & Sheth, A. (2010, November). A Study in Hadoop Streaming with Matlab for NMR data processing. In 2nd IEEE International Conference on Cloud Computing Technology and Science (CloudCom), 2010 (pp. 786-789). IEEE.
- [9] **Gunaratna, D. A. K. S.**, Kodikara, N. D., & Premaratne, H. L. (2008). ANN Based Currency Recognition System using Compressed Gray Scale and Application for Sri Lankan Currency Notes-SLCRec. In Proceedings of world academy of science, engineering and technology (Vol. 35, pp. 235-240).

Technical Skills

- **Application Development & Programming:** Ontology development (RDF, RDFS, OWL, SPARQL Querying), Semantic Web and Linked Data, Java, C (basic), C++ (basic), Map-Reduce (Hadoop), Python, Web development (JSP, GWT, ASP.net, PHP, XML, XSD and XSL, Java Script and Ruby on Rails), Machine Learning (Weka)
- **Databases:** Virtuoso triple store, Oracle, SQL Server and MySQL, NoSQL (basic)

Selected Courses

Semantic Web and Knowledge Representation, Advanced Databases, Programming Languages, Computational Complexity, Information Retrieval, Algorithms, Distributed Computing, Machine Learning (Coursera), Writing in the Sciences (Stanford Online)

Activities and Professional Services

[1] Activities

- (a) Co-organizer of the second international workshop on summarizing and presenting entities and ontologies (SumPre16) and ENSEC16 summarization challenge at ESWC 2016.
- (b) Co-organizer of the first international workshop on summarizing and presenting entities and ontologies (SumPre15) at ESWC 2015. Established the workshop.
- (c) Member of the W3C Linked Data Platform Group (2012 - 2014).

[2] PC Member

- ISWC (2015) and ESWC (2016)

[3] Reviewer

- World Wide Web (WWW) (2012, 2013, 2014, 2015), International Semantic Web Conference (ISWC) (2012, 2013, 2014), Extended Semantic Web Conference (ESWC) (2013, 2014), Knowledge Engineering and Knowledge Management (EKAW) (2012), International Journal on Semantic Web and Information Systems (IJSWIS), Semantic Web Journal.

References

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