Amar Viswanathan Kannan

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I am a doctoral candidate with Prof. James A. Hendler at the Tetherless world Constellation, RPI. I also work with Prof. Deborah McGuinness on Knowledge Graph Evaluation and Correction. In addition, I have worked on the Watson UIMA Pipeline deployed at RPI to develop QA systems for Knowledge Graphs. I focus on reformulating large-scale Knowledge Graph Queries. I have worked extensively with Freebase, DBpedia, YAGO which encompass information in the form of billions of triples ($\approx$ 23 billion with size $\approx$ 75 GB for DBpedia,YAGO alone). My research enables finding *interesting, relevant and diverse* information from these Knowledge Graphs.

Research Interests

- **Semantic Web :** RDF, SPARQL, Ontologies, Knowledge Graph Evaluation
- **Query Reformulation :** Query & Search Result Diversity
- **Natural Language Processing :** Sentiment Analysis, Information Extraction, Question Answering
- Applied Machine Learning, Unsupervised Learning for Knowledge Graphs

Education

Academic

Rensselaer Polytechnic Institute	**Troy, New York**
PhD Computer Science , CGPA 3.7	*2011–2018(Spring)*
Rensselaer Polytechnic Institute	**Troy, New York**
M.S. Computer Science , CGPA 3.9	*2014–2016*
Anna University	**Chennai, India**
B.E. Computer Science, 84% with Distinction	*2003-2007*

Other Certifications

Udacity Nanodegree	**Udacity,Online Verified Degree**
Machine Learning Engineer	*2016–2017*

Publications

[Viswanathan et al., 2017]Viswanathan, A., Michaelis, J. R., de Mel, G. R., and Hendler, J. (2017). In context query reformulation for failing sparql queries. In *Ground/Air Multisensor Interoperability, Integration, and Networking for Persistent ISR VIII*.

[Rashid et al., 2017]Rashid, S., Viswanathan, A., Gross, I., Kendall, E., and McGuinness, D. (2017). Leveraging Semantics for Large-Scale Knowledge Evaluation. In *WebSci-17 Workshop on Industrial Knowledge Graphs*. **WebScience-17**.

[Viswanathan, 2016]Viswanathan, A. (2016). Pragmatic reformulation in knowledge graphs. In *AAAI-16 Doctoral Consortium*. **AAAI**.

[Viswanathan et al., 2016]Viswanathan, A., De Mel, G., and Hendler, J. (2016). Pragmatics and Discourse Knowledge Graphs. In *AAAI-16 Workshop on Symbiotic Cognitive Systems*. **AAAI**.

[Balakrishnan et al., 2013]Balakrishnan, R., Vasudevan, B. G., Viswanathan, A., Raghunathan, P. V., and Ravindran, U. (2013). Methods for analyzing user opinions and devices thereof. **US Patent App. 13/946,832**.

[Erickson et al., 2013]Erickson, J. S., Viswanathan, A., Shinavier, J., Shi, Y., and Hendler, J. A. (2013). Open Government Data: A Data Analytics Approach. ***IEEE Intelligent Systems***, pages 19–23.

[Viswanathan et al., 2011]Viswanathan, A., Venkatesh, P., Vasudevan, B. G., Balakrishnan, R., and Shastri, L. (2011). Suggestion Mining from Customer Reviews.

[Hussain et al., 2009]Hussain, T., Balakrishnan, R., and Viswanathan, A. (2009). Semantic wiki aided business process specification. In ***Proceedings of the 18th international conference on World Wide Web***, pages 1135–1136. ACM.

Employment

Rensselaer Polytechnic Institute	**Troy**
Research Assistant	*August 2012– current*
IBM T.J. Watson Research Center	**Yorktown Heights**
Summer Research Intern, **Mentor: Dr.Geeth De Mel**	*Summer 2015*
IBM T.J. Watson Research Center	**Yorktown Heights**
Summer Research Intern, **Mentor: Dr.Kaoutar el Maghraoui**	*Summer 2014*
Rensselaer Polytechnic Institute	**Troy**
Teaching Assistant, **Data Structures**	*August 2011– May 2012*
Infosys Technologies Limited	**Bengaluru**
Senior Systems Engineer, Infosys Labs	*October 2007– July 2011*

Poster Presentations and Talks

2016

- Amar Viswanathan. Pragmatics Aware Querying in Heterogeneous Knowledge Graphs, **Thirtieth AAAI Conference on Artifical Intelligence, Doctoral Consortium**, Phoenix, AZ (USA) 02/12/2016.
- Amar Viswanathan, Geeth de Mel, James A .Hendler. Pragmatics and Discourse in Knowledge Graphs, **Workshop on Symbiotic Cognitive Systems, Thirtieth AAAI Conference on Artificial Intelligence,** Phoenix, AZ(USA) 02/12/2016.

2015

- Amar Viswanathan, Geeth de Mel, James A. Hendler. Pragmatic Query Reformulation and Answer Generation in Knowledge Graphs, **IBM Cognitive Computing Symposium,** RPI, Troy, NY 11/09/2015. (Poster Session)
- Amar Viswanathan. Pragmatic Query Reformulation in Heterogeneous Knowledge Graphs, **Intern Talk and Poster Session,** IBM, Yorktown Heights, NY, 08/22/2015.

2014

- Amar Viswanathan. "Not Elementary, My dear Watson.."- Extending Watson for Question Answering on Linked Open Data, **IBM Cognitive Computing Symposium,** IBM, Yorktown Heights, NY 10/30/2014. (Poster Session)
- Amar Viswanathan. Semi Supervised Pattern Summarization of Client Resolution Data, **IBM Summer Intern Poster Event** IBM, Yorktown Heights, NY, 08/22/2014. (Poster Session), Public talk on 08/06/2014

2013

- John Erickson, Amar Viswanathan, Josh Shinavier, Yongmei Shi, James A. Hendler. Text Analysis of International Open Government Data, **NY State Health Data Codeathon**, RPI, Troy, NY, 12/20/2013.

Research Projects

Academic

- **Pragmatics and Instance Data Aware Querying in Knowledge Graphs:** *Fall 2014 - Current*
  The focus of my work is on providing contextual reformulations to Knowledge Graph queries using a *Schema- and Data-Aware Framework*. The initial part of this work was selected at the AAAI Doctoral Consortium in 2016. You can find the talk at http://tinyurl.com/aaaidc16
- **Question Answering Systems, Watson and Beyond:** *Fall 2013 - Summer 2014*
  I developed an extension for the Watson QA pipeline to answer Knowledge Graph queries. We used a corpus of $\approx$ 8 billion triple statements to train our system. More details on the system at http://tinyurl.com/watsonrdf
- **Large Scale Text Analysis of International Open Government Metadata:** *Summer 2013*
  I worked on the textual understanding of the metadata collected by the IOGDS project and analyzed the textual metadata using traditional Named Entity Recognition and Information Retrieval measures. The results were also presented in different visualizations developed using d3.js. The details can be found at http://tinyurl.com/logd2.

Industry

- **Infosys Technologies Limited:** *2007-2011:* I worked on pattern oriented NLP which enabled the development of iSEE (Infosys Sentiment Extraction Engine). This also resulted in a patent, which was awarded in 2013

Other

- **Udacity & Coursera:** *2016-2017:* In addition to regular research, I completed the Udacity Machine Learning Nanodegree research projects . For the nanodegree requirements I completed projects in Unsupervised Learning, Supervised Learning, Reinforcement Learning and basic Deep Learning. My capstone was on Sentiment Analysis. I also enjoyed Andrew Ng's Machine Learning and Deep Learning MOOC.

Awards

- **AAAI 2016:** SIGAI Doctoral Consortium Award
- **Finalist :** 3MT Three Minute Thesis at RPI's Gradaute Research Symposium 2016

Skills

- **Programming Languages:** Java, Python
- **Web Front-End:** XHTML, CSS, Bootstrap, jQuery, d3.js
- **Ontology Development:** Protégé
- **Tools & Libraries:** NLTK, scikit-learn, numpy, pandas, jupyter, Stanford Natural Language Toolkit, Virtuoso, Apache Jena

Graduate Courses

- **Semantic Web:** Advanced Semantic Technologies, Ontology Engineering, Advanced Web Science, Semantic E-Science
- **Machine Learning:** Foundations of Data Science, Data Science, Database Mining
- **Natural Language Processing:** NLP with Watson, Knowledge Graphs from IE Text
- **Theory:** Analysis of Algorithms, Foundations of Network Science
- **Applied Math:** Linear Algebra, Numerical Computing