

## **Cartic Ramakrishnan**

Research Associate  
Biomedical Informatics Division  
Children's Hospital Medical Center  
3333 Burnet Avenue,  
Cincinnati, OH 45229

rcartic@gmail.com  
<http://knoesis.wright.edu/students/cartic/>  
Tel: 706-206-1684

### **Research Interest**

My research interests lie at the intersection of the Semantic Web initiative, Machine Learning & Natural Language processing. I am specifically interested in the use of domain knowledge to improve unsupervised and semi-supervised learning techniques for text mining. My long-term research interests lie in the discovery of emergent knowledge from textual and structured data. My current research focuses on the extraction of disease mechanism models from text and structured data. I am also interested in knowledge representation and the semi-automated creation of large-scale domain ontologies. I am interested in application domains such as biology, ecology and any domain that has vast continuously growing corpora of text and structured data.

### **Education**

Wright State University, Dayton, Ohio Aug 2008  
Ph.D. Student in Computer Science Advisor: Dr. Amit P. Sheth

University of Georgia, Athens, Georgia 2001 - 2006  
Ph.D. Student in Computer Science Advisor: Dr. Amit P. Sheth  
(Transferred To Wright State University with Dr. Amit P. Sheth)

University of Georgia, Athens, Georgia 1999 - 2001  
M.S. in Artificial Intelligence  
(Course work completed. transferred to Ph.D. in Computer Science)

Maharashtra Institute of Technology, Pune India 1998  
B.E. in Computer Engineering

### **Work Experience**

*Children's Hospital Medical Center, Biomedical Informatics Division*

Research Associate

September 2008 - Present

Knowledge Discovery from Biomedical Data:

- Developing Knowledge Discovery mechanisms for the discovery of synergistic knowledge.
- Extending past work on Text mining to realize the creation of a biomedical knowledge discovery platform
- Developing ontologies and Knowledge Representation formalisms for representing biological mechanistic models

*Kno.e.sis center @ Wright State University*

Graduate Research Assistant

Dayton, OH 2007-Present

Knowledge Extraction from biomedical text:

- Identification and extraction of complex entities
- Classification of complex entities
- Extraction of Relationships between entities and representation as semi-structured data (RDF)
- Knowledge Discovery over graph data
  - Subgraph discovery
  - Semantic associations
  - Discovery of mechanistic models in biomedical text

*IBM Research Labs, Almaden*

Research Intern

San Jose, California Summer 2006

Relationship extraction from unstructured text (Wikipedia) to create an ontology for the cardiology domain.

*National Library of Medicine, NIH*

Research Intern

Rockville, MD Summer 2002, Summer 2004

We developed a hierarchical clustering algorithm to cluster concepts extracted from unstructured text documents from the medical/biomedical domain. This was developed as a first step towards semi-automated development of large-scale ontologies. Mentor: Dr. Vipul Kashyap.

*LSDIS Lab @ University of Georgia*

Graduate Research Assistant

Athens, GA 2001-2006

I was a part of the team that introduced an approach that supports querying for Semantic Associations on the Semantic Web. Semantic Associations capture complex relationships between entities involving sequences of predicates, and sets of predicate sequences that interact in complex ways. We subsequently developed an algorithm to extract the most informative subgraph of an RDF graph, given a pair of end points.

*Computer Science Department @ University of Georgia*

Graduate Teaching Assistant

Athens, GA Fall 2003, Fall 2004

I assisted my advisor Dr. Amit Sheth in designing and teaching the first graduate level Semantic Web course of its kind.

*Animal Science Department @ UGA*

Graduate Research Assistant

Athens, GA Fall 1999 -Fall 2001

During my Masters I worked on developing a web-based expert system for dairy herd management. I was heading a 3 member team and was responsible for the knowledge acquisition and overall design of the system.

#### *Extentia Information Technology*

Software Engineer

Pune, India 8/1998-2/1999

At Extentia I worked on developing a suite of addins for Microsoft Office products. This work was done as a part of the Cannon OfficeReady suite of products. In addition to this I worked on developing a medical document indexing and retrieval system

### **Publications**

#### *Conference Papers*

- “*Joint Extraction of Compound Entities and Relationships from Biomedical Literature*” Cartic Ramakrishnan, Pablo N. Mendes, Rodrigo A. T. S. da Gama, Guilherme C. N. Ferreira, Amit P. Sheth. Web Intelligence 2008: 398-401
- “*Unsupervised Discovery of Compound Entities for Relationship Extraction.*” Cartic Ramakrishnan, Pablo N. Mendes, Shaojun Wang, Amit P. Sheth EKAW 2008: 146-155
- “*A Framework for Schema-Driven Relationship Discovery from Unstructured Text,*” with K. Kochut & A. P. Sheth (International Semantic Web Conference 2006).
- “*Semantic Analytics on Social Networks: Experiences in Addressing the Problem of Conflict of Interest Detection,*” with B. Aleman-Meza, M. Nagarajan, A. Sheth, B. Arpinar, L. Ding, P. Kolari, A. Joshi & T. Finin (World Wide Web 2006).
- “*Dairy producer’s Assistant: A Web-based Expert System for Dairy Producers.,*” C. Ramakrishnan et. al. (39th Annual Southeastern Regional ACM Conference 2001).
- “*KublAI: An Intelligent Agent for Microsoft’s Age of Kings. Extended abstract of a work in progress.*” with A. L. Bahuman, J. Li, W. D. Potter, J. N. Rushton (39th Annual Southeastern Regional ACM Conference 2001).

#### *Journal Papers*

- “*Blazing Semantic Trails between Web Resources.*” with A. P. Sheth (IEEE Internet Computing 11(4): 77-81 (2007))
- “*Discovering Informative Connection Subgraphs in Multi-relational Graphs*” with W. H. Milnor, M. Perry and A. P. Sheth (SIGKDD Explorations 7(2): 56-63 (2005)).
- “*Ranking Complex Relationships on the Semantic Web.*” with B. Aleman-Meza, C. Halaschek-Wiener, I. B. Arpinar, A. P. Sheth (IEEE Internet Computing 9(3): 37-44 (2005)).
- “*TaxaMiner: An Experimental Framework for Automated Taxonomy Bootstrapping.*” with V. Kashyap, C. Ramakrishnan, C. Thomas and A. Sheth (International Journal of Web and Grid Services, Special Issue on Semantic Web and Mining Reasoning, September 2005.).

- “*Semantic Association Identification and Knowledge Discovery for National Security Applications.*” with A. Sheth, B. Aleman-Meza, I. B. Arpinar, C. Halaschek, C. Bertram, Y. Warke, K. Anyanwu, D. Avant, F. S. Arpinar, and K. Kochut. (In *Journal of Database Management*, 16(1), 33-53, Jan-March 2005, Eds: L. Zhou and W. Kim.).
- “*Semantics for the Semantic Web: The Implicit, the Formal and the Powerful.*” with A. P. Sheth, C. Thomas (In *Int. J. Semantic Web Inf. Syst.* 1(1): 1-18 (2005)).
- “*Semantic (Web) Technology In Action: Ontology Driven Information Systems for Search, Integration and Analysis.*” with A. P. Sheth, (In *IEEE Data Eng. Bull.* 26(4): 40-48 (2003)).

#### *Workshop Papers*

- “*Peer-to-Peer Discovery of Semantic Associations.*” M. Perry, M. Janik, C. Ramakrishnan, C. Ibaez, I. B. Arpinar, A. P. Sheth (P2PKM 2005)

#### *Book Chapters*

- “*Geospatial Ontology Development and Semantic Analytics. In Handbook of Geographic Information Science*” with B. Arpinar, A. Sheth, L. Usery, M. Azami & M. Kwan (Geospatial Ontology Development and Semantic Analytics. In *Handbook of Geographic Information Science*, Eds: J. P. Wilson and A. S. Fotheringham, Blackwell Publishing).
- “*Semantics for the Semantic Web: The Implicit, the Formal, and the Powerful*” with A. Sheth & C. Thomas (Chapter 2.8 in *Online and Distance Learning: Concepts, Methodologies, Tools and Applications*, L. Tomei, Ed., Information Science Reference (an imprint of IGI Global), 2008).

#### *Posters*

- Towards (Semi-)automatic Generation of Bio-medical ontologies. with V. Kashyap, T. C. Rindflesch (AMIA 2003 Annual Symposium on Biomedical and Health Informatics).

#### *Tutorials:*

- Cartic Ramakrishnan, Meenakshi Nagarajan, and Amit Sheth, “*Text Analytics for Semantic Computing - the good, the bad and the ugly*”, Second IEEE International Conference on Semantic Computing Santa Clara, CA, USA - August 4-7, 2008

### **Professional Activities**

#### *Program Committee Member*

- ICSC 2008 Second IEEE International Conference on Semantic Computing Santa Clara, CA, USA - August 4-7, 2008
- CIKM 2007 ACM Sixteenth Conference on Information and Knowledge Management (CIKM2007) November 6-8, 2007, Lisbon, Portugal
- CIA 2007 Eleventh International Workshop CIA 2007 on Cooperative Information Agents September 19 - 21, 2007 Delft University of Technology, Delft, The Netherlands

- WISE 2006 The 7th International Conference on Web Information Systems Engineering Wuhan, China October 23-26,2006
- DBA 2006 The IASTED International Conference on Databases and Applications as part of the Twenty-Fourth IASTED International Multi-Conference on APPLIED INFORMATICS February 14 - 16, 2006 Innsbruck, Austria

*External Reviewer*

- ICDE 2006 The 22nd International Conference on Data Engineering April 3-8, Atlanta, GA, 2006
- KDD 2007 The Thirteenth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, San Jose, California Aug 12-15 2007