

Curriculum Vitae

Jie Bao
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BIOGRAPHICAL SUMMARY

Dr. Jie Bao is a research associate at the Tetherless World Constellation, Rensselaer Polytechnic Institute. He is also a research affiliate at the Decentralized Information Group, Massachusetts Institute of Technology (MIT) and a visiting scientist at Raytheon BBN Technologies. He received his Ph.D. in computer science from the Iowa State University (ISU) in 2007. His research activities span a variety of topics in Artificial Intelligence, Semantic Web and Machine Learning, including description logics, semantic wikis, context modeling, semantic information theory, rule languages, closed world reasoning, policy modeling, semantic data integration, modular ontologies, collaborative ontology building, web privacy protection, neural network and data mining.

Dr. Bao has authored more than 50 refereed research papers. He has served on Organizing Committees or Programming Committees of more than 30 international conferences and workshops, including International Joint Conferences on Artificial Intelligence (IJCAI), International Semantic Web Conference (ISWC), Extended/European Semantic Web Conference (ESWC), and Asian Semantic Web Conference (ASWC), among others. He is currently serving on the editorial board of Journal of Emerging Technologies in Web Intelligence. He was a member of the OWL Working Group at W3C in which he co-authored two W3C specification documents of OWL 2.

EMPLOYMENT STATUS:

U.S. Permanent Resident

EDUCATION

Ph.D. in Computer Science, Dec. 2007
Iowa State University, Ames, Iowa, USA
Dissertation: Representing and Reasoning with Modular Ontologies.
Advisor: Vasant Honavar

M.S. in Electrical Engineering, July 2001
Hefei University of Technology (HFUT), Hefei, Anhui, China
Thesis: Research on Some Key Issues of Synergetic Neural Network.
Advisors: Jun Gao and Mengxian Pan

B.S. in Electrical Engineering, July 1998
Hefei University of Technology (HFUT), Hefei, Anhui, China
Thesis: Data Visualization and Processing.

WORK EXPERIENCES

Research Affiliate Jan 2010 - present

Massachusetts Institute of Technology (MIT), Cambridge, Massachusetts, USA
Decentralized Information Group

Visiting Scientist

Jan 2010 - present

Raytheon BBN Technologies, Cambridge, Massachusetts, USA
Interdisciplinary Research Center (IRC),
Network Science Collaborative Technology Alliance (NS CTA),

Postdoctoral Research Associate

Feb 2008 - present.

Rensselaer Polytechnic Institute, Troy, New York, USA
Tetherless World Constellation & Department of Computer Science
Supervisor: James A. Hendler

Postdoctoral Research Associate

Aug 2007 - Feb 2008

Research Assistant

Aug 2001 - Jul. 2007

Iowa State University, Ames, Iowa, USA
Artificial Intelligence Research Laboratory
Department of Computer Science
Supervisor: Vasant Honavar

RESEARCH INTERESTS

- Current research focus: Web Science, Semantic Web, Linked Data, Description Logics, Ontology Engineering, Data Integration and Information Theory.
- Previous research topics: Machine Learning, Data Mining, Neural Network, Pattern Recognition, Image Processing, Image Database and Complex System.

AWARDS AND HONORS

1. **Robert Stewart Research Excellence Award**, Department of Computer Science, Iowa State University. Apr. 2007. (1.3%, awarded to 2 students from 150 graduate students)
2. **Best Paper Award**, the First Asian Semantic Web Conference (ASWC), *Modular Ontologies - A Formal Investigation of Semantics and Expressivity*. Sept. 2006. (4.1%)
3. **Science & Technology Progress Award of Anhui Province (Third Class)**, *Study on the Theory and Application of Synergetic Pattern Recognition*. Apr. 2004, China.
4. **Best Paper Award in Natural Science**, Second Class in Anhui Province, *Optical-electronic Shape Recognition System Based on Synergetic Associative Memory*. Dec. 2003. China.

PARTICIPATED PROJECTS

For details, see “Research Experiences” section (page 15)

Dates	Project	Role
2010-present BBN, RPI	Network Science Collaborative Technology Alliance (NS-CTA) [ARL] http://www.ns-cta.org/ns-cta-blog/?page_id=280	<i>Primary Research Staff</i> . Led research on semantic information theory and composite network modeling.
2009-present RPI, MIT	Theory and Practice of Accountable Systems [NSF] http://dig.csail.mit.edu/2009/NSF-TPAS/index.html	Led formal analysis of the AIR policy language, using RIF as a policy exchange language and formal analysis of N3 Logic.

2010-present MIT, RPI	Financial Linked Data Modeling and Analysis	Led research on modeling XBRL using OWL and SPARQL, and its application in investment analysis
2008-present RPI	International Technology Alliance (ITA) [UK MoD and US ARL] http://www.usukita.org/	<i>Primary Research Staff</i> in ITA Project 12. Led research on semantic wikis, context modeling, controlled natural language and distributed reasoning.
2008-2010 RPI, MIT	Transparent Accountable Data Mining Initiative (TAMI) [NSF] http://dig.csail.mit.edu/TAMI/	<i>Primary researcher</i> on policy test-bed development.
2010 RPI	ISWC 2010 Metadata http://www.w3.org/2001/sw/wiki/ISWC_2010_Data_and_Demos	<i>Metadata Chair</i> . Led ISWC metadata committee for the development of metadata and tools for the conference
2008-2009 RPI	OWL (Web Ontology Language) [W3C] http://www.w3.org/2007/OWL	<i>Member</i> . Participated the design of the OWL 2 language, led the authoring of two W3C recommendations
2008-2009 RPI	Inference Web [NSF] http://inference-web.org/	Led research on modeling provenance information in semantic wikis, comparison of OWL-based provenance ontologies, and modeling integrity constraint using OWL.
2008 RPI	RPI Map http://map.rpi.edu	<i>Primary Investigator</i> . Led the architectural design and development of the map application.
2008- 2009 RPI	Knowledge Acquisition for Human Terrain (KAHT) [DARPA]	<i>Primary Researcher</i> . Led the evaluation of semantic wiki technologies in knowledge acquisition.
2004-2008 ISU	SGER: Exploratory Investigation of Modular Ontology Languages [NSF] http://www.cs.iastate.edu/~honavar/ailab/projects/modularontologies.html	<i>Graduate Research Assistant</i> (04-07) <i>Primary Research Staff</i> (07-08). Led research on the theory of Package-based Description Logics (P-DL) and federated reasoning algorithms for modular ontologies. <i>Key contributor of the proposal</i> .
2007-2008 ISU	Privacy-Preserving Reasoning with Hidden Knowledge [NSF Industry-University Research Center for Information Protection, ISU]	<i>Co-PI</i> . Led the development of privacy-preserving reasoning algorithms for graph- and description logic-based ontologies. <i>Key contributor of the proposal</i> .
2003-2006 ISU	The Intelligent Data Understanding System (INDUS) Project [NSF and NIH] http://www.cild.iastate.edu/projects/indus.html	<i>Graduate Research Assistant</i> . Developed a theoretically sound approach of semantic query answering from heterogeneous biological data sources. Designed and implemented the INDUS software toolkit.
2005-2007 ISU	ITR: Algorithms and Software for Knowledge Acquisition from Heterogeneous Distributed Data	<i>Graduate Research Assistant</i> . Developed learning algorithms based on relational Bayesian classifier from semantically

	[NSF] http://www.cs.iastate.edu/~honavar/nsftr02.html	heterogeneous biological data sources.
2005-2006 ISU	Collaborative Building Environment of Animal Trait Ontology [ISU Center for Integrated Animal Genomics (CIAG)] http://www.genome.iastate.edu/bioinfo/projects/ATO/	<i>Graduate Research Assistant.</i> Developed collaborative ontology building methods based on modular ontologies. Implemented the COB-Editor software and led its application in building the Animal Trait Ontology. <i>Primary contributor to the proposal.</i>
2004 ISU	Integrated Ontology for Video Annotation (IOVA) [NSF and Mayo Clinic]	<i>Graduate Research Assistant.</i> Developed an approach to annotation of a video database using a domain specific ontology OMED MST, a domain independent video ontology in OWL that encodes the structure and attributes of video data; demonstrated the approach in annotating a medical database of colonoscopy videos.
2001-2002 ISU	Data Mining of Electric Power Usage Data to Develop Customer Profiles [Power Domain, Inc.]	<i>Graduate Research Assistant.</i> Developed electricity load forecasting algorithms using statistical and neural network methods.
2000-2001 HFUT,China	Research of Some Key Issues on Synergetic Associative Memory [Ministry of Education (MOE) of China]	<i>Graduate Research Assistant.</i> Investigated synergetic neural network and its application in pattern recognition in the image domain. <i>Key contributor to the proposal.</i>
1999-2000 HFUT,China	Research of Shape Recognition System based on Associative Memory [MOE of China]	<i>Graduate Research Assistant.</i> Developed algorithms for optoelectronic shape recognition system using synergetic neural network and Hopfield neural network.
1998-2000 HFUT, China	Associative Memory and Content-Based Image and Video Retrieval [NSF of China and NSERC (National Science and Engineering Research Council) of Canada]	<i>Graduate Research Assistant.</i> Developed algorithms for video retrieval using subtitle information. Developed the ImagePower image processing platform. <i>Key contributor to the proposal.</i>
1999-2001 HFUT, China	Picture Archiving and Communication Systems (PACS) [Best Co. Ltd (Hefei, China)]	<i>Graduate Research Assistant.</i> Investigated a repository for storing medical images/videos and associated metadata about media and patient (e.g., medical records); developed algorithms for adaptive X-ray image acquisition; implemented the ImagePro medical image database and processing system.

PROFESSIONAL SERVICES

Grant Reviewer

1. National Science Foundation (NSF), Faculty Early Career Development (CAREER) Program, 2010.
2. Vienna Science, Research and Technology Fund (Wiener Wissenschafts-, Forschungs- und Technologiefonds, WWTF), 2010. Austria.

Journal Editor

3. Member of Editorial Board, Journal of Emerging Technologies in Web Intelligence, since 2009.
4. Guest Editor, Journal of Multimedia Tools and Applications, Special Issue on Data Semantics for Multimedia Systems, 2009.
5. Guest Editor, Journal of Multimedia, 2009.

Journal Reviewer

6. Journal of Multimedia Tools and Applications, 2010
7. International Journal on Artificial Intelligence Tools (IJAIT), 2010
8. Web Intelligence and Agent Systems (WIAS): An International Journal, 2009. (3 times)
9. Journal of Web Semantics (JWS), 2009-2010.
10. IEEE Transactions on Knowledge and Data Engineering (TKDE), 2009.
11. Data & Knowledge Engineering (DKE), 2009-2010.
12. Knowledge and Information Systems: An International Journal, 2009.
13. Journal of the Franklin Institute, 2009
14. Journal of Zhejiang University-SCIENCE A, 2008
15. Journal of Autonomous Agents and Multi-Agent Systems (JAAMS), 2007

Conference Organizing Committee Member

16. Metadata chair of the 5th International Web Rule Symposium: Research Based and Industry Focused (RuleML-2011), July, 2011. Barcelona, Spain.
17. Metadata chair of the 9th International Semantic Web Conference (ISWC 2010). Nov 7 - 11, 2010. Shanghai, China.
18. Co-chair of the Social Web Track, the 7th Extended Semantic Web Conference (ESWC 2010). May 30 - Jun 3, 2010. Heraklion, Greece.
19. Tutorial Chair of the 4th Asian Semantic Web Conference (ASWC 2009). Dec 6-9, 2009. Shanghai, China.

Workshop Organizing Committee Member

20. Co-chair of the 4th International Workshop on Modular Ontologies (WOMO 2010). May 11-14, 2010. Toronto, Canada.
21. Co-chair of the AAAI 09 Spring Symposium on Social Semantic Web: Where Web 2.0 Meets Web 3.0. March 23-25, 2009. Stanford, California, USA.
22. Co-chair of the IEEE International Workshop on Data Semantics for Multimedia Systems and Applications (DSMSA2008), held in conjunction with The IEEE International Symposium on Multimedia (ISM2008). December 15-17, 2008. Berkeley, California, USA.
23. Co-chair of the Special Session on Semantic Representation, Analysis, and Transmission for Large-Scale Multimedia Database, and Software Engineering Supporting Tools at IEEE 8th International Conference on Intelligent System Design and Applications (ISDA). November 26-28, 2008. Kaohsiung City, Taiwan, Republic of China.

Organizer of Other Academic Meetings

24. Co-Chair of the 2nd Semantic MediaWiki Meetup. March 25, 2009. Stanford, California, USA.

25. Organizing Team Member of the SemanticWiki mini-series. 2008-2009. Ontology Community (ontolog.cim3.net).

Conference Program Committee Member

26. The 22nd International Joint Conferences on Artificial Intelligence (IJCAI-11). Jul. 16-22, 2011. Barcelona, Spain.
27. The 8th Extended Semantic Web Conference (ESWC 2011). May 29 - Jun 4, 2011. Heraklion, Greece.
28. The 9th International Semantic Web Conference (ISWC 2010). Nov 7 - 11, 2010. Shanghai, China.
29. The 4th International Conference on Web Reasoning and Rule Systems (RR 2010). Sept. 22-24 2010. Bressanone, Italy.
30. The 15th International Conference on Applications of Natural Language to Information Systems (NLDB 2010). June 23-25, 2010. Cardiff, Wales, UK
31. The 2nd International Symposium on Data, Privacy & E-Commerce (ISDPE 2010). June 20-22, 2010. Buffalo, NY, USA.
32. The 21st IEEE International Conference on Tools with Artificial Intelligence (ICTAI 2009). Nov. 2-4, 2009. Newark, NJ, USA.
33. The 8th International Semantic Web Conference (ISWC 2009). Oct. 25-29, 2009. Washington, DC, USA.
34. The 3rd International Conference on Advances in Semantic Processing (SEMAPRO 2009). Oct. 11-16, 2009. Sliema, Malta.
35. The 21st International Joint Conferences on Artificial Intelligence (IJCAI-09). Jul. 11-17, 2009. Pasadena, California, USA.
36. The 2nd International Conference on Advanced Engineering Computing and Applications in Sciences (ADVCOMP 2008). September 29 - October 4, 2008. Valencia, Spain.
37. The International Conference on Computational Intelligence and Security (CIS'07). Dec. 17-19, 2007. Harbin, China.
38. The International Conference on Advances in Semantic Processing (SEMAPRO 2007). Nov. 4-9, 2007. Papeete, French Polynesia (Tahiti).

Workshop Program Committee Member

39. The 5th International Workshop on Modular Ontologies (WoMO2011). August 8-12, 2011. Ljubljana, Slovenia.
40. The 8th International Workshop On OWL: Experiences and Directions (OWLED2011). 5-6 June 2011. San Francisco, California, USA.
41. The 2010 International Workshop on Web-scale Knowledge Representation, Retrieval, and Reasoning (Web-KR3 2010). August 31, 2010. Toronto, Canada.
42. The 1st Workshop on Semantic Personalized Information Management (SPIM 2010). May 18, 2010. Malta.
43. AAAI Spring Symposium on Linked Data Meets Artificial Intelligence (LinkedAI). Mar. 22-24 2010. Stanford, CA, USA.
44. The 2nd IEEE International Workshop on Data Semantics for Multimedia Systems and Applications (DSMSA 2009). Dec. 14-16, 2009. San Diego, CA, USA.
45. Semantics for the Rest of Us -- Variants of Semantic Web Languages in the Real World (SemRUs), co-located with ISWC 2009. Oct. 26, 2009, Washington, DC, USA.
46. The 5th International Workshop on Scalable Semantic Web Knowledge Base Systems (SSWS2009), co-located with ISWC 2009. Oct. 25, 2009. Washington, DC, USA.
47. The 2nd Social Data on the Web workshop (SDoW 2009). co-located with ISWC 2009. Oct. 25 2009. Washington, DC, USA.
48. The 6th International Workshop on OWL: Experiences and Directions (OWL ED). Oct.23-24, 2009. Washington, DC ,USA.

49. The 3rd Chinese Semantic Web Symposium (CSWS 2009). Aug. 30-31, 2009. Nanjing, China.
50. The 10th Argentine Symposium on Artificial Intelligence (ASAI 2009). Aug. 24-25, 2009. Mar Del Plata, Argentina.
51. The 1st International Workshop on Motivation and Incentives on the Web (Webcentives), co-located with WWW'09. Apr. 20-24, 2009. Madrid, Spain.
52. The 1st Social Data on the Web workshop (SDoW 2008), co-located with the 7th International Semantic Web Conference (ISWC2008). Oct. 27, 2008. Karlsruhe, Germany.
53. The 4th International Workshop on Scalable Semantic Web knowledge Base Systems (SSWS 2008), co-located with 7th International Semantic Web Conference (ISWC2008). Oct. 27, 2008. Karlsruhe, Germany.
54. The International Workshop on Ontologies: Reasoning and Modularity (WORM-08). June 2, 2008. Tenerife, Spain.
55. The 2008 Workshop on Collaborative Distributed Knowledge Discovery (CDKD'08). May 19-23, 2008. Irvine, California, USA.
56. The Workshop on Cyberinfrastructure for e-Science (CyIneS 2007). Nov. 2, 2007. Fremont, California, USA.
57. The 2nd International Workshop on Modular Ontologies (WOMO 2007). Oct. 28, 2007. Whistler, BC, Canada
58. The 1st International Workshop on Modular Ontologies (WOMO 2006). Nov. 5, 2006. Athens, Georgia, USA

Conference & Workshop Invited Reviewer

59. The 3rd Annual Conference of the International Technology Alliance (ACITA), 2010.
60. The 3rd International Provenance and Annotation Workshop (IPAW2010).
61. IEEE International Symposium on Policies for Distributed Systems and Networks (POLICY), 2010.
62. The 2nd Annual Conference of the International Technology Alliance (ACITA), 2009.
63. ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA), 2009.
64. Web Science Conference (WebSci'09) - Society On-line, 2009.
65. IEEE International Conference on Networking, Sensing and Control (ICNSC), 2008.
66. The 3rd Indian International Conference on Artificial Intelligence (IICAI), 2007.
67. The 2nd International Workshop on Semantic Web for Collaborative Knowledge Acquisition (SWeCKa), 2007.
68. IEEE Workshop on Knowledge Acquisition from Distributed, Autonomous, Semantically Heterogeneous Data and Knowledge Sources (KADASH), 2005.

PUBLICATIONS (Papers with [⊕] are under review)

(NOTE: Published papers and talk slides are available at http://tw.rpi.edu/wiki/Jie_Bao_Publication)

Journal Papers:

1. Zhi-Liang Hu, **Jie Bao** & James M. Reecy (2008). CateGORizer: A Web-Based Program to Batch Analyze Gene Ontology Classification Categories. In *Online Journal of Bioinformatics*, 9(2):108-112.
2. LaRon M. Hughes, **Jie Bao**, Zhi-Liang Hu, Vasant Honavar & James M. Reecy (2008). Animal Trait Ontology (ATO): the Importance and Usefulness of a Unified Trait Vocabulary for Animal Species. In *Journal of Animal Science*, 86(6):1485-1491.

Journal Articles:

3. Mei-Ling Shyu, Yu Cao, Jun Kong, Ming Li, Mathias Lux & **Jie Bao** (2010). Introduction to the special issue on “data semantics for multimedia systems”. *Journal of Multimedia Tools and Applications*, 46(2-3):147–154.
4. Mark Greaves, Li Ding, **Jie Bao**, and Uldis Bojars (2009). Report of the AAAI 2009 Spring Symposium on Social Semantic Web: Where Web 2.0 Meets Web 3.0. *AI Magazine*, 30(3):94.
5. James A. Hendler. & **Jie Bao** (2008). Why It Matters. *IEEE Intelligent Systems*, 23(4): 2-3.

Journal Papers in Chinese:

6. Li Ding, Gang Wu, **Jie Bao**, Ying Ding (2010). Semantic Web Portal: Where Semantic Data Meets Human Users. In the *Communications of China Computer Federation (CCCF)* 6(8):53-58. [In Chinese]
7. **Jie Bao**, Jun Gao & Yongqiang Yu (2001). Some Key Problems in the Development of PACS. In *Chinese Journal of Radiology*, 35 (3), 168-170. [In Chinese]
8. **Jie Bao**, Lin Pu, Jun Gao, Guojun Hong & Xi Huang (2001). Engineering Drawing Archiving and Communication System. *Journal of Computer-Aided Design and Computer Graphics*, 13 (5): 413-417. [In Chinese]
9. Lin Pu, Guojun Hong, Juguang Lin, **Jie Bao** & Hua Yan. (2001). Study on Automobile Panel Dies Drawing Archiving and Communication System. *Digital Manufacturing Industry*, 2001(1): 63-65. [In Chinese]
10. **Jie Bao** & Jun Gao (2000). Component PACS System Design Orienting to Internet. *Journal of Computer Engineering*, 26 (7): 9-10,115. [In Chinese]
11. Yongqing Yang, Jun Gao, **Jie Bao** & Xuedong Yang (2000). Close-Caption Retrieval and Extraction Based on Video. *Journal of Computer Applications*, 20 (10): 33-36. [In Chinese]

Book Chapters:

12. Paul R. Smart, **Jie Bao**, Dave Braines and Nigel R. Shadbolt. (2010) Development of a Controlled Natural Language Interface for Semantic MediaWiki. Book Chapter in *Controlled Natural Language*. Lecture Notes in Computer Science (LNCS) Volume 5972/2010. Springer Berlin / Heidelberg. p. 206-225.
13. Shih-Hsi Liu, Yu Cao, Ming Li, Thell Smith, John Harris, **Jie Bao**, Barrett R. Bryant & Jeff Gray (2010). Functional and QoS Semantics-Driven SOA-based Biomedical Multimedia Processing. Book Chapter in *Service Composition, Business Process Engineering and Domain-Specific Challenges in Service Oriented Architecture: Engineering Non-Functional Requirements*. IGI Global.
14. **Jie Bao**, George Voutsadakis, Giora Slutzki & Vasant Honavar (2009). Package-based Description Logics. Book Chapter in: *Modular Ontologies: Concepts, Theories and Techniques for Knowledge Modularization*. Editors: Parent, C., Spaccapietra, S., and Stuckenschmidt, H. Berlin: Springer. LNCS 5445. p. 349–371.

Conference Papers:

15. [⊕] Xian Li, **Jie Bao**, James A. Hendler (2011). Fundamental Analysis Powered by Semantic Web. Submitted to *2011 IEEE Symposium on Computational Intelligence for Financial Engineering & Economics (CIFER)*.
16. **Jie Bao**, Graham Rong, Xian Li, and Li Ding (2010). Representing Financial Reports on the Semantic Web - A Faithful Translation from XBRL to OWL. In *The 4th International Web Rule Symposium (RuleML)*. (p. 144-152)
17. Ankesh Khandelwal, **Jie Bao**, Lalana Kagal, Ian Jacobi, Li Ding & James A. Hendler (2010). Analyzing the AIR Language: A Semantic Web (Production) Rules Language. In *The 4th International Conference on Web Reasoning and Rule Systems (RR)*. (p. 58-72)

18. Jiao Tao, Evren Sirin, **Jie Bao** & Deborah L. McGuinness (2010) Integrity Constraints in OWL. In *The Twenty-Fourth AAAI Conference on Artificial Intelligence* (AAAI 2010).
19. **Jie Bao**, Li Ding, Rui Huang, Paul R. Smart, Dave Braines & Gareth Jones (2009). A Semantic Wiki Based Light-WeightWeb Application Model. In the Proceedings of the 4th Asian Semantic Web Conference (ASWC). (p. 168-183).
20. George Voutsadakis, Giora Slutzki, Vasant Honavar & **Jie Bao** (2008). Federated ALCI: Preliminary Report. In Proceedings of the *IEEE/WIC/ACM International Conference on Web Intelligence* (WI) 2008. (p. 575-578).
21. Alistair Russell, Paul R. Smart R., Dave Braines, Yannis Kalfoglou, **Jie Bao** & Nigel R. Shadbolt (2008). A Visual Approach to Semantic Query Design Using a Web-Based Graphical Query Designer. In *the Proceeding of the 16th International Conference on Knowledge Engineering and Knowledge Management (EKAW 2008)*. (p. 275-291)
22. **Jie Bao**, George Voutsadakis, Giora Slutzki & Vasant Honavar (2008). On the Decidability of Role Mappings between Modular Ontologies. In *the Proceeding of the Twenty-Third Conference on Artificial Intelligence* (AAAI 2008). (p. 400-405).
23. **Jie Bao**, Giora Slutzki & Vasant Honavar (2007). Privacy-Preserving Reasoning on the Semantic Web. In *the Proceedings of IEEE/WIC/ACM International Conference on Web Intelligence 2007*. (p. 791-797).
24. **Jie Bao**, Giora Slutzki & Vasant Honavar (2007). A Semantic Importing Approach to Knowledge Reuse from Multiple Ontologies. In *the Proceedings of Twenty-Second Conference on Artificial Intelligence* (AAAI 2007). (p. 1304-1309).
25. Yimin Wang **Jie Bao**, Peter Hasse & Guilin Qi (2007). Evaluating Formalisms for Modular Ontologies in Distributed Information Systems. In *the Proceeding of the First International Conference on Web Reasoning and Rule Systems* (RR 07). (p. 178-193).
26. **Jie Bao**, Doina Caragea & Vasant Honavar (2006). On the Semantics of Linking and Importing in Modular Ontologies. In *Proceedings of the 5th International Semantic Web Conference (ISWC 2006)*. (p. 72-86).
27. **Jie Bao**, Doina Caragea & Vasant Honavar (2006). Package-Based Description Logics - Preliminary Results. In *Proceedings of the 5th International Semantic Web Conference (ISWC 2006), Doctoral Consortium Track*. (p. 967-969).
28. **Jie Bao**, Doina Caragea & Vasant Honavar (2006). Modular Ontologies - A Formal Investigation of Semantics and Expressivity. In *Proceedings of the 1st Asian Semantic Web Conference (ASWC2006)*. (p. 616-631). (**Best Paper Award**)
29. **Jie Bao**, Doina Caragea & Vasant Honavar (2006). A Tableau-Based Federated Reasoning Algorithm for Modular Ontologies. In *Proceedings of the 2006 IEEE/WIC/ACM International Conference on Web Intelligence (WI)*. IEEE Press. (p. 404-410).
30. **Jie Bao**, Doina Caragea & Vasant Honavar (2006). Towards Collaborative Environments for Ontology Construction and Sharing. In *Proceedings of the 2006 International Symposium on Collaborative Technologies and Systems (CTS 2006)*. IEEE Press. (p. 99-108).
31. Doina Caragea, Jun Zhang, **Jie Bao**, Jyotishman Pathak & Vasant Honavar (2005). Algorithms and Software for Collaborative Discovery from Autonomous, Semantically Heterogeneous, Distributed Information Sources. In *Proceedings of the 16th International Conference of Algorithmic Learning Theory (ALT)*. (p. 13-44).
32. **Jie Bao**, Yu Cao, Wallapak Tavanapong & Vasant Honavar (2004). Integration of Domain-specific and Domain-independent Ontologies for Colonoscopy Video Database Annotation. In H. R. Arabnia (Ed.), *Proceeding of International Conference on Information and Knowledge Engineering (IKE 04)*. Csrea Press.(p. 82-88).
33. **Jie Bao** & Jun Gao (2001). PACS Development in China and the Component PACS System. In E. L. Siegel & H. K. Huang (Eds.), *Proceedings of SPIE. Vol.4323, Medical Imaging 2001* (p. 380-385).
34. Jun Gao, **Jie Bao**, Dingguo Chen, Yongqing Yang & Xuedong Yang (2001). Optical-electronic Shape Recognition System Based on Synergetic Associative Memory. In N. M. Nasrabadi & A. K. Katsaggelos (Eds.), *Proceedings of SPIE, Vol. 4305, Applications of Artificial Neural Networks in*

Image Processing VI. (p. 138-148). (**Best Paper Award in Natural Science, Second Class in Anhui Province**)

35. Jun Gao, Yixian Wang, **Jie Bao**, Xuedong Yang & Qiang Hu (2000). Valid Region Recognition in Digital Images of Medical X-Ray Imaging. In H. Liu & Q. Luo (Eds.), *Proceedings of Biomedical Photonics and Optoelectronic Imaging, SPIE*, Vol. 4224, (P. 139-144).
36. Jun Gao, **Jie Bao** & Ling Huang (2000) Some Key Issues in Drawing Archiving and Communication System. In *Proceedings of the 3rd International Conference on Computer-Aided Industrial Design and Conceptual Design (CAID&CD)*. International Academic Publishers. (p. 308-312)
37. Xiaozheng Han, **Jie Bao**, Yuanqing Wang, Jun Gao & Jianguo Jiang (2000). Learning in Multiagent Distributed Control Matters. In *Proceedings of the 3rd International Conference on Computer-Aided Industrial Design and Conceptual Design (CAID&CD)*, International Academic Publishers. (p. 616-620)
38. **Jie Bao**, Jun Gao & Xudong Zhang (2000). Digital Image Self-Adaptive Acquisition in Medical X-Ray Imaging. In *Proceedings of International Conference on Intelligent Information Processing (IIP 2000), IFIP World Computer Congress (WCC)*.

ACITA Conference Papers

ACITA is the annual conference for the researchers inside the ITA (International Technology Alliance in Network and Information Science) project. The papers are peer reviewed and conference proceedings are online (http://www.usukita.org/papers/ita_conf_papers.html).

39. **Jie Bao**, Paul R. Smart, David Mott & Dave Braines. A Formal Context Representation Framework for Network-Enabled Recognition. In the 4th Annual Conference of the International Technology Alliance (ACITA'10), London, UK.
40. Dave Braines, Paul R. Smart & **Jie Bao**. Emergent Capabilities For Collaborative Teams In The Evolving Web Environment. In the 4th Annual Conference of the International Technology Alliance (ACITA'10), London, UK.
41. Paul R. Smart, Dave Braines, **Jie Bao**, David Mott, Trung Dong Huynh & Nigel R. Shadbolt. Supporting Distributed Coalition Planning with Semantic Wiki Technology. In the 4th Annual Conference of the International Technology Alliance (ACITA'10), London, UK.
42. **Jie Bao**, Paul R. Smart, Dave Braines, Gareth Jones & Nigel R. Shadbolt (2009). A Controlled Natural Language Interface for Semantic MediaWiki. In *The 2nd Annual Conference of the International Technology Alliance (ACITA'09)*. A longer version in *Tetherless World Constellation (RPI) Technical Report*. no. TW-2009-05.
43. **Jie Bao**, Li Ding, Paul R. Smart, Dave Braines & Gareth Jones (2009). Rule Modeling using Semantic MediaWiki. In *The 2nd Annual Conference of the International Technology Alliance (ACITA'09)*. <http://www.usukita.org/papers/5243/details.html>
44. Gareth Jones, Dave Braines, Paul R. Smart, Trung Dong Huynh & **Jie Bao** (2009). GIDS: Global Interlinked Data Store. In *the 2nd Annual Conference of the International Technology Alliance (ACITA'09)*. <http://www.usukita.org/papers/5245/details.html>. (A longer paper is published as an ITA technical report at <http://www.usukita.org/papers/5240/details.html>)
45. Dave Braines Yannis Kalfoglou, Paul R. Smart, **Jie Bao**, Nigel R. Shadbolt & James A. Hendler (2008) Semantic Web techniques to support Interoperability in Distributed Networked Environments. In *the Proceeding of the 2nd Annual Conference of the International Technology Alliance (ACITA'08)*. (p. 223-230)

Conference Papers in Chinese:

46. **Jie Bao** & Jun Gao (2000). Integrate Degree of System Hierarchy. In Systems Engineering, Systems Science and Complexity Research, *Proceeding of 11th Annual Conference of Systems Engineering Society of China* (p. 47-52). [In Chinese]

47. **Jie Bao**, Jun Gao, Hongwei Liu & Xudong Zhang (1999). Medical X-Ray Digital Image Processing System Based on NSP. In *Proceedings of the 5th Chinese National Symposium on Computer Technology*. Vol. 1. (p. 79-82). [In Chinese]

Workshop Papers

48. **Jie Bao**, Li Ding & Deborah L. McGuinness (2010). Contextualized RDF Importing. In *W3C Workshop on RDF Next Steps*. Stanford, CA, USA. <http://www.w3.org/2009/12/rdf-ws/papers/ws33>
49. Li Ding, **Jie Bao**, James Michaelis, Jun Zhao & Deborah L. McGuinness (2010). Reflections on Provenance Ontology Encodings. In *The third International Provenance and Annotation Workshop (IPAW2010)*. http://tw.rpi.edu/portal/File:IPAW2010_RP_Ding.pdf
50. Jiao Tao, Evren Sirin, **Jie Bao** & Deborah L. McGuinness (2010) Extending OWL with Integrity Constraints. In the *2010 International Workshop on Description Logics (DL2010)*.
51. **Jie Bao**, Li Ding & Deborah L. McGuinness (2009). Semantic History: Towards Modeling and Publishing Changes of Online Semantic Data. In *Proceedings of the 2nd Social Data on the Web workshop (SDoW2009) of ISWC 2009*. CEUR Workshop Proceedings Vol 520, online at CEUR-WS.org/Vol-520/.
52. **Jie Bao**, Li Ding, & James A. Hendler (2009). Collective Cognition with Semantic Mediawiki: Lessons and Experiences. In *the 1st ITA Workshop on Network-Enabled Cognition*. <http://www.usukita.org/files/1569240215.pdf>
53. **Jie Bao**, Paul R. Smart, Dave Braines & Nigel R. Shadbolt (2009). A Controlled Natural Language Interface for Semantic Media Wiki Using the Rabbit Language. In *Workshop on Controlled Natural Language (CNL) 2009*. CEUR Workshop Proceedings, online at CEUR-WS.org/Vol-448/.
54. Jun Fang, **Jie Bao** & Lei Guo (2008). Boundary-based Module Extraction in EL++ Ontologies. In *the 2nd International Workshop on New Forms of Reasoning for the Semantic Web (NEFORS 2008)* at ASWC 2008. <http://tw.rpi.edu/wiki/TW-2008-23>
55. Jiao Tao, Li Ding, **Jie Bao** & Deborah L. McGuinness (2008). Characterizing and Detecting Integrity Issues in OWL Instance Data. In *Proceedings of OWL: Experiences and Directions Workshop (OWLED 2008) EU at ISWC 2008*. CEUR Workshop Proceedings Vol 432, online at CEUR-WS.org/Vol-432/.
56. Dave Braine, Yannis Kalfoglou, Paul R. Smart, Nigel R. Shadbolt & **Jie Bao** (2008). A Data-Intensive Lightweight Semantic Wrapper Approach to Aid Information Integration. In *the 4th International Workshop on Contexts and Ontologies (C&O-2008)* at ECAI 2008. <http://www.usukita.org/papers/3744/details.html>
57. **Jie Bao**, Doina Caragea & Vasant Honavar (2007). Query Translation for Ontology-Extended Data Sources. In *Proceedings of AAAI'07 Workshop on Semantic e-Science (SeS'07)*. AAAI Technical Report WS-07-11. ISBN 978-1-57735-338-6. (p. 9-16)
58. Doina Caragea, **Jie Bao** & Vasant Honavar (2007). Learning Relational Bayesian Classifiers on the Semantic Web. In *Proceedings of Workshop on Semantic Web for Collaborative Knowledge Acquisition (SweCka)*, co-located with IJCAI 2007.
59. Yimin Wang, Peter Hasse & **Jie Bao** (2007). A Survey of Formalisms for Modular Ontologies. In *Proceedings of Workshop on Semantic Web for Collaborative Knowledge Acquisition (SweCka)*, at IJCAI 2007. <http://www.aifb.kit.edu/web/Inproceedings1341>
60. **Jie Bao** & Vasant Honavar (2006). Adapt OWL as a Modular Ontology Language. In *Proceedings of OWL: Experiences and Directions Workshop (OWLED 2006)*, *CEUR Workshops Vol. 216*, online at CEUR-WS.org/Vol-216/.
61. **Jie Bao** & Vasant Honavar (2006). Divide and Conquer Semantic Web with Modular Ontologies - A Brief Review of Modular Ontology Language Proposals. In *Proceedings of the 1st International Workshop on Modular Ontologies (WOMO 2006)*, *co-Located with ISWC 2006*. CEUR Workshops Vol-232. <http://ceur-ws.org/Vol-232/>. (p. 1-14).
62. **Jie Bao** & Vasant Honavar (2006) Representing and Reasoning with Modular Ontologies. In *Proceedings of AAAI Fall Symposium on Semantic Web for Collaborative Knowledge Acquisition (SweCka)*. AAAI Technical Report FS-06-06, ISBN 978-1-57735-304-1. (p. 86-89).

63. Doina Caragea, **Jie Bao** & Vasant Honavar (2006). A General Strategy for Knowledge Acquisition from Semantically Heterogeneous Data Sources. In *Proceedings of AAAI Fall Symposium on Semantic Web for Collaborative Knowledge Acquisition (SweCka)*. AAAI Technical Report FS-06-06, ISBN 978-1-57735-304-1. (p. 1-6).
64. **Jie Bao**, Doina Caragea & Vasant Honavar (2006). A Distributed Tableau Algorithm for Package-Based Description Logics. In *Proceedings of the 2nd International Workshop on Context Representation and Reasoning (CRR 2006), co-Located with ECAI 2006*.
65. **Jie Bao**, Zhi-Liang Hu, Doina Caragea, J. Reecy, & Vasant Honavar (2006). A Tool for Collaborative Construction of Large Biological Ontologies. In *Proceedings of the 4th International Workshop on Biological Data Management (BIDM), DEXA Workshops*. (p. 191-195)
66. **Jie Bao** & Vasant Honavar (2005). Collaborative Package-Based Ontology Building and Usage. In *Proceedings of IEEE Workshop on Knowledge Acquisition from Distributed, Autonomous, Semantically Heterogeneous Data and Knowledge Sources, co-Located with ICDM 2005*. Technical Report Number: 2005-08 November, 2005 Published by Department of Mathematics and Computing Science. Saint Marys University. ISBN 0-9738918-4-X. (p. 35-44).
67. Doina Caragea, **Jie Bao**, Jyotishman Pathak, Adrian Silvescu, Carson M. Andorf, Drena Dobbs & Vasant Honavar (2005). Information Integration from Semantically Heterogeneous Biological Data Sources. In *Proceedings of the 3rd International Workshop on Biological Data Management (BIDM'05)*, co-located with DEXA 2005 (p. 580-584).
68. Doina Caragea, Jyotishman Pathak, **Jie Bao**, Adrian Silvescu, Carson M. Andorf, Drena Dobbs & Vasant Honavar (2005). Information Integration and Knowledge Acquisition from Semantically Heterogeneous Biological Data Sources. In *Proceedings of the 2nd International Workshop on Data Integration in Life Sciences (DILS'05)* (p. 175-190).
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70. **Jie Bao**, Jiao Tao & Deborah L. McGuinness (2010). Context Representation for the Semantic Web. In *Proceedings of the WebSci10: Extending the Frontiers of Society On-Line*. <http://journal.webscience.org/395/>
71. Denny Vrandecic, Christoph Lange, Michael Hausenblas, **Jie Bao** & Li Ding (2010). Semantics of Governmental Statistics Data. In: *Proceedings of the WebSci10: Extending the Frontiers of Society On-Line*, <http://journal.webscience.org/400/>
72. Li Ding, K. Krasnow Waterman, **Jie Bao**, Lalana Kagal & Deborah L. McGuinness (2009). Towards a Semantic Web Testbed for Collaborative Policy Development. In *Proceedings of the WebSci'09: Society On-Line*, Mar. 18-20, 2009, Athens, Greece. <http://journal.webscience.org/225/>
73. **Jie Bao**, Li Ding, Deborah L. McGuinness & James A. Hendler (2008). Towards Social Webtops Using Semantic Wiki. In *Proceedings of the Poster and Demonstration Session at the 7th International Semantic Web Conference (ISWC2008)*. Karlsruhe, Germany. CEUR Workshops Vol-401. <http://ceur-ws.org/Vol-401/>.
74. **Jie Bao** & Vasant Honavar (2007). Privacy-Preserving Reasoning with Hidden Knowledge on the Semantic Web. In *4th European Semantic Web Conference (ESWC 2007)*. Poster Track. Innsbruck, Austria.
75. Doina Caragea, Adrian Silvescu, Jyotishman Pathak, **Jie Bao**, Carson M. Andorf, Changhui Yan, Drena Dobbs & Vasant Honavar (2005). Knowledge Acquisition from Autonomous, Distributed, Semantically Heterogeneous Data Sources. In the *13th International Conference on Intelligent Systems for Molecular Biology (ISMB 2005), Poster Program # G-67*, Detroit, Michigan.
76. Jyotishman Pathak, **Jie Bao**, Doina Caragea, Adrian Silvescu, Carson M. Andorf, Changhui Yan, Drena Dobbs & Vasant Honavar (2005). Indus: A System for Information Integration and Knowledge Acquisition from Autonomous, Distributed, and Semantically Heterogeneous Data Sources. In the *13th International Conference on Intelligent Systems for Molecular Biology (ISMB 2005), Demo Program*, Detroit, Michigan.

77. **Jie Bao** & Vasant Honavar (2004). Ontology Language Extensions to Support Collaborative Ontology Building. In *3rd International Semantic Web Conference (ISWC2004)*, Poster Track #37. Hiroshima, Japan.

Extended Abstracts

78. Li Ding, **Jie Bao** & Deborah L. McGuinness (2008). Knowledge Provenance in Semantic Wikis. *Eos Transactions. American Geophysical Union (AGU)*, 89(53), Fall Meeting 2008, abstract #IN22A-05
79. Zhi-Liang Hu, **Jie Bao** & James M. Reecy (2007). Gene Ontology (GO) Terms Classifications Counter. Plant and Animal Genome XV Conference. January 13-17, 2007. San Diego, California.
80. Zhi-Liang Hu, **Jie Bao**, Max F. Rothschild, Vasant Honavar & James M. Reecy (2006). Developing Frameworks and tools for Animal Trait Ontology (ATO). In *Plant and Animal Genome Xiv Conference*. San Diego, California.
81. LaRon M. Hughes, **Jie Bao**, Zhi-Liang Hu, Vasant Honavar & James M. Reecy (2006). A Project for the Creation of a Unified Trait Vocabulary for Farm Animals. In *Workshop on the Representation of Phenotypes*. National Center for Biomedical Ontology. Stanford University, Palo Alto, CA.
82. Doina Caragea, **Jie Bao**, Jyotishman Pathak & Vasant Honavar (2005). Ontology-based Information Integration using INDUS System. In *The Program of the 8th Annual Bio-Ontologies Meeting (Bio-Ont SIG 2005)*. Poster Session. Detroit, MI.
83. Vasant Honavar, **Jie Bao**, Drena Dobbs, Robert L. Jernigan, Doina Caragea, Adrian Silvescu, Jyotishman Pathak, Carson M. Andorf, Changhui Yan & Jun Zhang (2004) Algorithms And Software For Information Extraction, Integration, And Data driven Knowledge Acquisition From Heterogeneous, Distributed, Autonomous Biological Information Sources. In *Standards and Ontologies for Functional Genomics 2 (SOFG)*, Poster Track, Oct 23-26, 2004, Philadelphia, PA.
84. **Jie Bao**, Changhui Yan, Doina Caragea & Vasant Honavar (2004). Tools for Integrating Heterogeneous Data Sources from a User Perspective. In *Standards and Ontologies for Functional Genomics 2 (SOFG)*. Poster Track, Oct 23-26, 2004, Philadelphia, PA.
85. **Jie Bao**, Ellen Maxon & Vasant Honavar (2003). Short-Term Load Forecasting Based on Neural Network and Local Regression. In *the 1st JVA International Symposium on Modern Computing*, Poster Track. Ames, IA.

Non- reviewed Conference Posters and Extended Abstracts:

86. **Jie Bao**, Li Ding, Deborah L. McGuinness, Peter Fox & James A. Hendler (2009). Semantic Wiki Based Collaborative Scientific Modeling Infrastructure. In *Spring Symposium of Institute of Applied Mathematics and Computational Science (IAMCS)*. College Station, TX.
87. **Jie Bao**, Giora Slutzki & Vasant Honavar (2007). Representing and Reasoning with Modular Ontologies. In *Emerging Technologies Conference (ETC) 2007*. Ames, IA.

Edited Proceedings:

88. Oliver Kutz, Joana Hois, **Jie Bao** & Bernardo Cuenca Grau (2010). *Modular Ontologies – Proceedings of the Fourth International Workshop on Modular Ontologies*. Springer. In *Frontiers in Artificial Intelligence and Applications*, Volume 210. IOS Press. (ISBN 978-1-60750-543-3)
89. Mark Greaves, Li Ding, **Jie Bao** & Uldis Bojars (2009). Social Semantic Web: Where Web 2.0 Meets Web 3.0. *AAAI Spring Symposium*, Technical Reports SS-09-08. AAAI Press. (ISBN 978-1-57735-415-4).

International Standard Specifications:

Note: A W3C Recommendation is endorsed by the W3C as a standard for wide deployment on the Web. It has undergone extensive internal and public review and testing. For more information, c.f.

http://en.wikipedia.org/wiki/W3C_recommendation

90. **Jie Bao**, Sandro Hawke, Boris Motik, Peter F. Patel-Schneider, & Axel Polleres (2009). *rdf:PlainLiteral: A Datatype for RDF Plain Literals*. *World Wide Web Consortium (W3C) Recommendation 27 October 2009*. <http://www.w3.org/TR/rdf-plain-literal/>
91. **Jie Bao**, Elisa Kendall, Deborah L. McGuinness & Peter F. Patel-Schneider (2009). *OWL 2 Web Ontology Language: Quick Reference Guide*. *World Wide Web Consortium (W3C) Recommendation 27 October 2009*. <http://www.w3.org/TR/owl2-quick-reference/>

Theses:

92. **Jie Bao** (2007). *Representing and Reasoning with Modular Ontologies*. Ph.D. Dissertation, Department of Computer Science, Iowa State University. Dec 2007. (ISBN:978-0-549-33714-0.)
93. **Jie Bao** (2001). *Research on Some Key Issues of Synergetic Neural Network*. Master's Thesis, Department of Computer and Information, Hefei University of Technology. [In Chinese]
94. **Jie Bao** (1998). *Data Visualization and Processing*. Bachelor's Thesis, Hefei University of Technology. [In Chinese. **Excellent Undergraduate Thesis**]

Technical Reports (Non-reviewed):

RPI Tetherless World TR site: <http://tetherless.rpi.edu/wiki/Publication>
ISU TR Site: <http://archives.cs.iastate.edu/>

95. **Jie Bao**, Li Ding & James A. Hendler (2009). *Knowledge Representation and Query in Semantic MediaWiki: A Formal Study*. In *Tetherless World Constellation (RPI) Technical Report*. No. TW-2008-42.
96. George Voutsadakis, **Jie Bao**, Giora Slutzki & Vasant Honavar (2008). *Privacy-Preserving Reasoning for Hypergraphs*, Technical Report, Department of Computer Science, Iowa State University, http://www.cs.rpi.edu/~baojie/pub/2008-04-25_PPhypgrph.pdf
97. Dave Braines, Paul R. Smart, **Jie Bao**, Alistair Russell, Nigel R. Shadbolt & James A. Hendler (2008). *Using Semantic Web Technologies to Support Information Processing and Coalition Decision Making*. *ITA Technical Report Project 12*. <https://www.usukitacs.com/?q=node/4042>
98. **Jie Bao** & Vasant Honavar (2005). *Reconciling Inconsistencies between Package-Extended Ontology Modules*. (Tech. Rep.). TR-403, *Computer Science, Iowa State University*.
99. **Jie Bao** & Vasant Honavar (2004). *Ontology Language Extensions to Support Localized Semantics, Modular Reasoning, and Collaborative Ontology Design and Ontology Reuse* (Tech. Rep.). TR-341, *Computer Science, Iowa State University*.
100. **Jie Bao** (2002). *Short-term Load Forecasting Based on Neural Network and Moving Average*. *Department of Computer Science, Iowa State University*. http://www.cs.rpi.edu/~baojie/pub/2002-05-08_stlf.pdf
101. **Jie Bao** (2001). *Potential Function Explain of the Quick Algorithm of Synergetic Neural Network* (Tech. Rep.). TR-404, *Computer Science, Iowa State University*.

TALKS ON ORIGINAL RESEARCH (Conference Presentations Excluded):

1. **Jie Bao**. *Semantic Web: In Quest for the Next Generation of Killer Apps*. University of Massachusetts Lowell, Oct 22, 2010. Lowell, MA, USA.
2. **Jie Bao**. *The Unbearable Lightness of Wiking - A Study of SMW Usability*. Spring Semantic MediaWiki Conference (SMWCon) 2010. May 22-23, 2010. Cambridge, MA, USA.
3. **Jie Bao**. *Semantic MediaWiki: a Wiki-based Semantic Web Workbench*. MIT IAP Linked Data workshop. Jan 13, 2010. MIT. Cambridge, MA, USA.
4. **Jie Bao**. *Towards Linked Ontologies and Data on the Semantic Web*. Oct 1, 2009. Decentralized Information Group Seminar, MIT. Cambridge, MA, USA.

5. **Jie Bao.** Introduction to Tetherless World Constellation @ RPI. May 4, 2009. Oracle, New England Research Center, Nashua, NH, USA
6. **Jie Bao & Li Ding.** From SMW to Rule. SMW users meeting. Mar. 25, 2009. Stanford, CA, USA.
7. **Jie Bao, Jin Guang Zheng, Rui Huang & Li Ding.** Mesh-up Map and Events on Semantic Wiki: Applications in e-Science and Campus Information System. SemanticWiki mini-series Session-4. Jan. 22, 2009. Online talk at the Ontolog Community (ontolog.cim3.net).
8. **Jie Bao, Li Ding & Zhenning Shangguan.** Concept Modeling on SemanticMediaWiki. SemanticWiki mini-series Session-3. Dec. 11, 2008. Online talk at the Ontolog Community (ontolog.cim3.net)
9. **Jie Bao.** Concept Modeling on Semantic Wiki. SMW users meeting. Nov 22, 2008. Boston, MA, USA
10. **Jie Bao.** Representing and Reasoning with Modular Ontologies. Colloquium of Department of Computer and Information Science. University of Oregon. Dec 6, 2007. Eugene, OR, USA.
11. **Jie Bao.** Query Translation for Data Sources with Heterogeneous Content Semantics. Quantum Leap Innovations, Inc. May 5, 2006. Newark, DE. USA.

PROFESSIONAL ORGANIZATION MEMBERSHIPS

- Member, ACM (Association for Computing Machinery), since 2008.
- Member, OWL (Web Ontology Language) Working Group at W3C (World Wide Web Consortium), 2008-2009.
- Member, AAAI (Association for the Advancement of Artificial Intelligence), since 2007.

GRANTS

PI or Co-PI:

1. US National Science Foundation Industry-University Research Center for Information Protection, Iowa State University. "***Privacy-Preserving Reasoning with Hidden Knowledge***". Vasant Honavar (PI), Jie Bao (Co-PI) and Giora Slutzki (Co-PI), \$25,000. 2008.

Primary Research Staff and key contributor to the proposal:

2. Network Science Collaborative Technology Alliance (NSCTA) ***Formal Modeling of Dynamic Networks and Network Interactions***. (Task E1.1) Primary Research Staff, 2011.
3. Network Science Collaborative Technology Alliance (NSCTA) ***Information Modeling for Composite Networks***. (Task R2.3) Primary Research Staff, 2011.
4. U.S. Army Research Laboratory and the UK Ministry of Defense: "***International Technology Alliance (ITA) In Network and Information Sciences Biennial Program Plan 2009 (BPP09), Project 12: Network-Enabled Shared Understanding***". Primary Research Staff. \$1,190,741, RPI fund \$178,262. 2009.

RESEARCH EXPERIENCES

At **Raytheon BBN Technologies** as a visiting scientist, Jan 2010 - Present.

Participated in the Network Science Collaborative Technology Alliance (NS-CTA), funded by U.S. Army Research Laboratory (ARL). I have been a leading researcher on the following projects inside the NS-CTA framework:

- "***Formal Modeling of Dynamic Networks and Network Interactions***" (2010-2011)
Identified the key factors that are critical to describing composite networks, with a focus

on temporal dynamics and context-dependent interactions.

- “*Information Modeling for Composite Networks*” (2010-2011). Investigated the quantitative modeling of the effect of semantics on information loss to understand how these semantics affect information utilization at the level of information, social and cognitive networks.
- “*Ontology and Shared Metrics for Dynamic Composite Networks*”. (2010) Developed a shared vocabulary and ontology across social, information, and communication networks. Specifically, the project identifies entities in a composite network and their attributes, the relationships among them and how do they affect network formation.
- “*Characterizing the Interdependencies Among Military Network Components*”. (2010) Investigated extending Shannon's classical information theory to address the modeling and measurement of semantics in communication, drawing on my previous work in the Semantic Web and Web Science.

At **Massachusetts Institute of Technology** as a Research Affiliate, Jan 2010 – present (part-time)

- Compared the expressivity and formal computational properties of AIR (Accountability In RDF) language to other rule-based languages and policy languages, in particularly to RIF (Rule Interchange Format) and N3 Logic.
- Developed a formal semantics for the AIR policy language; [in collaboration with Ankesh Khandelwal, RPI]
- Applied Semantic Web and Linked Data technologies into the financial sector. Developed a semantic-preserving translation from XBRL (eXtensible Business Reporting Language) to OWL (Web Ontology Language), and studied mashing up financial linked data with other social web and semantic web data for decision making (e.g., investment decisions).

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At **Rensselaer Polytechnic Institute**. Feb 2008 - Present.

- **Semantic Wikis** (Feb. 2008-present)

I investigated using semantic wikis to improve Semantic Web adoption and building end-user friendly Semantic Web tools:

- Developed a semantic portal wiki system to support typical content management tasks for a research community, including ontology generation and user-friendly query interfaces for information about people, events, literature, projects, etc. The wiki is used by the homepage of the Tetherless World Constellation (<http://tw.rpi.edu/wiki>);
- Investigated concept modeling, formal models, complexity analysis of semantic wikis; based on this, I extended Semantic Mediawiki modeling and query languages, leveraging logic program solvers for query answering.
- Developed semantic logging and provenance tracking of user activities on semantic wiki and their applications in explanation (<http://tw.rpi.edu/semhis>) [also part of the Inference Web project];
- Led the development of RPI Map (<http://map.rpi.edu>), a semantic wiki-based map system for RPI.
- Evaluated the usability Semantic MediaWiki by human study, as a part of the DARPA funded project "Knowledge Acquisition for Human Terrain (KAHT)".

- **Semantic Integration and Collaborative Planning** (Mar. 2008-present), as a part of the US-UK joint project “International Technology Alliance in Network and Information Science (ITA)”. (<http://tw.rpi.edu/wiki/Project/ITA>)

The project is aimed at improving interoperability and situational awareness to increase operational efficiency in international alliance tasks. My research addressed:

- Controlled natural language (CNL) interface for semantic wikis (<http://tw.rpi.edu/proj/cnl>);
 - Development of multilingual CNLs, including English and Chinese (Yayan) CNL;
 - Application of semantic wikis in collaborative planning;
 - Formal methods and tools for the collaborative construction and maintenance of ontology mappings among semantically heterogeneous applications;
 - Application of modular ontologies in efficient ontology reuse, including reuse by ontology interface and portable ontology alignment;
- **Knowledge Representation and Reasoning** (Mar. 2008-present), as a part of the Inference Web project (<http://inference-web.org/>)

Extended Semantic Web languages to model non-ontological knowledge and to support distributed reasoning:

- OWL instance data evaluation and constraint checking (<http://tw.rpi.edu/wiki/OWLEval>) and use OWL as an integrity constraint language. [joint work with Jiao Tao]
 - Extended McCarthy's context logic for context modeling for the Semantic Web, and extended RDF and N3 Logic for concrete context modeling languages.
 - Applied distributed reasoning methods in designing reasoners in the setting of mobile ad-hoc networks (also part of the ITA project).
- **Web Ontology Language (OWL)** (Mar. 2008 - Oct. 2009), as a member of the W3C (The World Wide Web Consortium) OWL Working Group, representing RPI. (<http://www.w3.org/2007/OWL/>)

The OWL working group was aimed at developing the next generation of Web ontology language, OWL 2, as a common language for Semantic Web applications. The OWL language is closely related to description logics thus has the support of automated reasoning. I co-authored two W3C standardization specifications, namely "*OWL Quick Reference Guide*" (part of which has been published as "OWL 2 Reference Card") and "*rdf:PlainLiteral: A Datatype for RDF Plain Literals*", both of which became W3C Recommendation in Oct. 2009. I also reviewed several other OWL 2 documents.

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At **Iowa State University (ISU)**, Aug. 2001-Feb 2008.

- **Modular Ontologies** (2003-2008). Worked on US NSF sponsored project "Exploratory Investigation of Modular Ontology Languages" (IIS-0639230 SGER) and its preliminary research.

The work was focused on the theory and application tools for combining and reasoning with multiple ontologies. This research explored topics such as the following:

- What are the minimal requirements for ensuring well-defined semantics in a modular ontology language?
- What ontology language features are needed to construct modular ontologies in practice?
- Can such reasoning be accomplished in a distributed setting without the need for centralized access to all of the ontology modules?
- How can ontologies be partially reused?
- How to combine ontology modules without losing the contexts of knowledge in these

modules?

- How expressive modular ontology languages can be without losing decidability?
- How can we support rapid, on-the-fly development of ontologies with good modularity?

To address these issues, this work developed language features, syntax, semantics and reasoning algorithms of a family of modular ontology languages, namely Package-Based Description logics (P-DL). This work contributed to the main body of my dissertation.

- **Trust and Privacy on Semantic Web** (2006-2008). Worked on US NSF Industry-University Research Center for Information Protection sponsored project “Privacy-Preserving Reasoning with Hidden Knowledge”.

This work was focused on practical methods to selectively share inference results using hidden knowledge, whenever it is feasible to do so without compromising the hidden knowledge. Such methods provide the necessary inference support on the top of syntactical access control methods of resources on the Semantic Web offered by policy languages. In particular, it explored:

- The notion of strong and weak privacy preservation in the Semantic Web context.
- Practical approaches for privacy-preserving inference with hierarchical ontologies and description logics.
- Privacy-preserving inference with distributed, modular ontologies.

- **Semantic Data Integration** (2003-2007). Worked on US NSF (IIS 0219699) and NIH (GM 066387) sponsored project “INDUS (the Intelligent Data Understanding System)”.

The work was focused on algorithms and tools for building and querying semantically heterogeneous, distributed data sources. My work included the following:

- Investigation on formal methods to model the (usually implicit) ontology commitment associated with data sources, including semantic commitments in both data schema and data instances (Spring 2006 to Spring 2007);
- Developing learning algorithms based on relational Bayesian classifier from ontology-extended biological data sources. (Fall 2005-Spring 2007)
- Development of a theoretically sound approach to formulation and execution of queries across semantically heterogeneous data sources. (Spring 2005 to Summer 2006);
- Designing and implementation of INDUS – a modular, extensible, open source software toolkit for data driven knowledge acquisition from large, distributed, autonomous, semantically heterogeneous data sources (in collaboration with Doina Caragea and Jyotishman Pathak). (Fall 2003 to Spring 2005)

- **Collaborative Ontology Building** (2004-2006). USDA NAGRP Bioinformatics Coordination Program sponsored project. (<http://www.animalgenome.org/bioinfo/projects/ATO/>).

The work was focused on developing theoretical methods and tools for building ontologies that require collaborations among individual experts or research groups in biological domains. This research was closely related to the work on modular ontologies. The specific aims of this work include:

- Theoretical investigation on key issues in collaborative ontology building, such as server-based ontology storage, inconsistency checking, conflicts control, and maintenance of ontology modules;
- Development of COB Editor, a modular ontology editor designed for a group of biologists to collaboratively build ontologies;

- Development of animal trait (phenotype) ontologies using the collaborative ontology editor (in collaboration with LaRon Hughes and Zhiliang Hu).
- On **Data Mining in Electric Power Usage** (2001-2002). Cooperative Research with Power Domain, Inc.

This project was focused on developing data mining methods for electric power usage to build customer profiles. My work addressed the following issues:

- Investigation on several hybrid forecasting models for time series based on neural network and statistical methods. These algorithms provide short-term forecasting of electricity load with high accuracy (98.8% for one-hour-ahead forecasting and 97.3% for 24-hour-ahead forecasting) and stability (on the test set of 6 months of hourly load data) in forecasting.
- Development of a Matlab program for predicting power usage (on hourly and daily basis).

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At **Hefei University of Technology** (HFUT), Sept.1998 - Jul. 2001

Research Assistant for Dr. Jun Gao and Prof. Mengxian Pan, Lab of Image and Information Processing (LIIP), Computer and Information Department.

My selected work at HFUT includes:

- **Synergetic Neural Network** (Sept. 1999 – July 2001)

Synergetic Neural Network (SNN) is a pattern recognition method inspired by the analogy between pattern recognition and pattern formation in open systems. My work extended the original SNN model in both theory and implementation optimizations. This work constituted the main body of my Master's thesis. Some specific results of this research included:

- The analysis of SNN as competitive neural networks and the comparison between SNN and other competitive neural networks, e.g., Self-Organizing Map (SOM);
 - The formal description and visualization of potential functions of SNN in the two-dimensional space;
 - The tuning of attractive domains and the attractors of SNN for the best approximation of pattern boundaries;
 - A fast algorithm for SNN based on linear and exponential function approximation of attractive domain boundaries and fast feature extraction (faster than the original algorithm by two orders);
 - The application of SNN in an optoelectronic shape recognition system;
 - Implementation of the SNN tool set in Matlab.
- On **PACS, Medical Image Processing and Image Databases** (Jan. 1999 - July 2001)

Picture Archiving and Communication Systems (PACS) are dedicated to the storage, retrieval, distribution and presentation of medical images. In collaborations with Anhui Medical University, Best Co. Ltd. (Hefei), and Department of Mechanical Engineering, HFUT, my work in this research included:

- Investigation of component-based, Internet-oriented PACS;

- Development of *ImagePro*, a system for medical image capturing, storage, query and computer-aided diagnosis. ImagePro was tested and installed at the First Affiliated Hospital of Anhui Medical University, Hefei, China.
 - An adaptive acquisition algorithm for medical x-ray images that can improve image quality by removing device bias signal and maximizing the dynamic range of captured images;
 - A valid region recognition algorithm based on Hough Transformation to improve captured image quality.
- **On Content-based Retrieval and Image Processing Tools** (Jun. 1998 - Sept. 2000)

This work was supported by the grant “*Associative Memory and Content-Based Image and Video Retrieval*” from NSF (National Natural Science Foundation) of China and NSERC (National Science and Engineering Research Council) of Canada, and by HFUT Research Foundation grant to Jun Gao on “*Multi-Resolution Image Analysis, Understand and Visualization*”. My work in this research included:

- The investigation on video retrieval based on its caption features (in collaboration with Youqing Yang);
- Algorithms for text recognition from videos using back-propagation (BP) neural network and synergetic neural network (SNN);
- The implementation of a video retrieval software in C++ (in collaboration with Yegan Qian);
- The development of Image Process Class (IPX) Library in C++ (Mar. - Jun. 1999);
- The development of ImagePower (in C++), an image process platform that realized many commonly used image processing algorithms. (Jun. 1998 - Jan. 1999)

TEACHING EXPERIENCES

Computer Science Department, Rensselaer Polytechnic Institute

- **Tutorial Lecturer** (Summer 2008): *Description Logics* (8 classes).

Computer Science Department, Iowa State University

- **Seminar Lecturer** (Fall 2007, Spring 2008): *Semantic Web and Web Service* (ComS 610).
- **Seminar Organizer and Lecturer** (Summer 2007): *Semantic Web*.
- **Teaching Assistant** (Fall 2002): *Principles in Artificial Intelligence* (ComS 572).

Computer and Information Department, Hefei University of Technology

- **Teaching Assistant** (Spring 2001): *Neural Network Theory and Applications*, undergraduate course. Gave lectures in the second half part of this course.
- **Instructor** (Spring 2001): *Data Structure*, graduate course for EDA Laboratory, Hefei University of Technology.
- **Advisor in Mathematical Contest of Modeling** (1998-2001): advisor for 3 teams in COMAP International Mathematical Contests of Modeling (MCM) and 3 teams in China Undergraduate Mathematical Contests of Modeling (CUMCM).
- **Lecturer** (Fall 2000): *Neural Network*, graduate tutorials.
- **Teaching Assistant** (Spring 2000 and Spring 1999): *Neural Network Theory and Applications*, undergraduate course.

MENTOR FOR GRADUATE STUDENTS

Department of Computer Science, Rensselaer Polytechnic Institute

- Jin Guang Zheng (Fall 2009) on RDFa
- Giovanni Thenstead (Summer 2009) on OWL RL reasoning
- Ankesh Khandelwal (Spring 2009) on policy language formalization
- Jiao Tao (Summer, Fall 2008) on closed world reasoning
- Rui Huang (Summer, Fall 2008) on semantic wiki

MENTOR FOR UNDERGRADUATE STUDENTS

Department of Computer Science, Rensselaer Polytechnic Institute

- Evan Patton (Summer 2008) on RDF reasoning
- Jin Guang Zheng (Spring, Summer, Fall 2008) on semantic wiki

Computer Science Department, Iowa State University

- Nikos Pappas, (Fall 2007) on Distributed Description Logic Reasoner
- Peter Wang, (Summer 2006) on Collaborative Ontology Development

Computer and Information Department, Hefei University of Technology

Mentored senior undergraduate students in their thesis projects

- Xu, Liuming, (Spring 2000) Valid Region Recognition of Self-Adaptive Acquisition in Medical X-Ray Imaging (Excellent Undergraduate Paper in the department)
- Fan, Yong, (Spring 2000) Technology Practice of Software Agent (Excellent Undergraduate Paper in the department)
- Hong, Yan, (Spring 2000) Research of Haken Model and Comparison with Other Competitive Learning Networks (Excellent Paper in the department)
- Yang, Youqing, (Spring 1999) Chinese Caption Retrieval Based on Video. (Excellent Undergraduate Paper in the department)
- Xu, Min, (Spring 1999) Wavelet Transformation and its Application in Brain Evoked Potential Analysis; (Excellent Undergraduate Paper in the department)

PROFESSIONAL EXPERTISE

Web Languages and Tools

- **Semantic Web Languages:** RIF-BLD (2009), RIF-PRD (2009), RDFa (2009), N3Logic (2009), AIR (2008), OWL 2 (2008), SKOS (2008), OBO (2005), SPARQL (2004), OWL (2003), RDF(S) (2003),
- **APIs:** ARC2 (2010), OWL API (2006), Jena (2003), Google Maps API (2008)
- **Web design Languages :** XSLT (2008), XML(2003), HTML(1998)
- **Domain Vocabulary:** XBRL (2010), XACML (2010), OMED MST (2004)
- **Ontology Editors:** TopBraid Composer (2009), Swoop (2006), Protégé (2003)
- **Ontology Reasoners:** HeriT (2008), Pellet (2004)
- **Semantic Wiki:** Halo Extension (2008), Semantic Forms (2008), AceWiki (2008), JSPWiki (2007), Semantic MediaWiki (2006)

Programming Languages

- **Scripts:** PHP (2007), Javascript (2003)
- **C :** Visual C++ (1998), MFC(1998), C++ (1997), ANSI C (1996)
- **Java:** AJAX (2005), Weka [machine learning package] (2003), JFC (2003), JSP(2003), Java (2001)
- **Math:** Simulink (2003), Matlab (1999), MatCAD (1996), Mathematica (1996)
- **Image and Graphics Libraries:** VTK(2000), Victor Lib(1999), OpenGL(1998), Leadtools (1998)
- **Other:** Visual Basic (1997), FORTRAN (1994), Pascal (1992), Basic (1991)

System and Database

- **OS:** Linux-Redhat/Ubuntu (2001), Windows7/XP/2000/98/95/3.1 (1994)
- **Database:** MySQL (2007), PostgreSQL (2005), Oracle(2003), SQL Server(2001), Access(1999), DBase & FoxBASE (1991)

REPRESENTATIVE SOFTWARE WORK

- **Extensions of Semantic MediaWiki** (2008-2009). (PHP based) Semantic MediaWiki (SMW) is a popular semantic wiki engine that enables users to add semantic data to wiki pages. I contributed or co-contributed the following extensions to SMW:
 - SemanticQueryPlus. A extension of the SMW modeling and query language to support additional expressivity such as negation, transitive properties, integrity constraints and cardinality counting. It connects SMW to a logic program solver for query answering.
<http://www.mediawiki.org/wiki/Extension:SemanticQueryPlus>
 - Semantic History. It modeling and publishing revision history It tracks revisions of a wiki page and enables their translation into semantic forms so that they can be better queried and represented.
<http://www.mediawiki.org/wiki/Extension:SemanticHistory>
 - Tetherless Map. It can generate a map based on results from a semantic query.
http://www.mediawiki.org/wiki/Extension:Tetherless_Map
 - DBLP Import. This extension allows users to batch import papers in the bibtex format from DBLP, a Computer Science paper bibliography.
http://www.mediawiki.org/wiki/Extension:DBLP_Import
 - Array Extension. It defines an additional set of parser functions that operate on arrays.
<http://www.mediawiki.org/wiki/Extension:ArrayExtension>
 - RDFa Extension. It provides the functionality of exchange semantic data of Mediawiki pages with other applications in the RDFa format.
<http://www.mediawiki.org/wiki/Extension:ArrayExtension>
- **INDUS** (2004-2006). (Java based) INDUS is a federated, query-centric system for knowledge acquisition from distributed, semantically heterogeneous data. I implemented the following components of INDUS:
 - Ontology Editor. It is used to define ontologies as ontological data types (linear numeric types or hierarchies) or to modify predefined ontologies.
 - Schema Editor. It is used to define the schema of a data source based on available types and ontologies.
 - Mapping Editor. It is used to define semantic correspondences between ontologies and between schemas.
 - Data Editor. It is used by data source owners to register data sources, and to edit or browse data with the given set of ontologies that are associated with the data.

- View Editor. It is used to define conceptual meta-models of data from different sources by specifying user-defined (virtual) data schemas, user ontologies, and the mappings between user schemas (or ontologies) and data source schemas (or ontologies).
- Query Engine and Editor. It allows users to graphically compose and execute queries in the user ontology, as if all the data was in a relational database structured according to the user view, without bringing all the data together physically.

URL: <http://www.cild.iastate.edu/software/indus.html> and <http://sourceforge.net/projects/indus-project/> (Source Forge)

- **COB Editor** (2005): is a collaborative, modular ontology editor. (Java based)

This tool supports collaborative editing of biological ontologies (e.g., Gene Ontology). It supports multiple domain experts to work on different components of the same ontology. I contributed the following components of the software:

- The database-based storage system for large-scale biological ontologies.
- The user management system that allows users to access different ontology modules with different administrative privileges.
- The ontology visualization interface that helps users to navigate through ontology modules.
- The inconsistency control mechanism that prevents concurrent editing conflicts between different users and logical clashes in different modules.
- The editing environment that enables users to build, modify or delete ontology modules and ontology axioms graphically.
- The serialization of ontologies in OWL and OBO formats.

URL: <http://www.animalgenome.org/bioinfo/projects/ATO/> and <http://sourceforge.net/projects/cob/> (Source Forge).

Also see: **Jie Bao**, Zhi-Liang Hu, James M. Reecy & Vasant Honavar (2005) A Proposal for Collaborative Ontology Editor for Animal Trait Ontology. Department of Computer Science, Iowa State University. http://www.cs.rpi.edu/~baojie/pub/2005-06-04_ato.pdf

- **ImagePro** (1998-1999). In collaborations with *Anhui Medical University* and *Best Co. Ltd.* (Hefei)

ImagePro is a medical image archiving and processing system base on Visual C++. My work provided the following functionalities:

- Image Acquisition from video (e.g. X-ray imaging or endoscopy imaging). It supports high-quality, manual or automatic image capturing from medical video devices. It can adjust capturing parameters (e.g. black balance and white balance) automatically according to features of the input video.
- Image Navigation and Query. It provides several view modes (by patients, hospital departments, or time information) to browse and query images.
- Metadata Management. It supports meta-data description of images about examination procedure, examined organ, diagnosis, therapy procedure, doctor and patient. It provides many pre-defined templates to create medical records associated with images. It allows graphical and text annotations on images.
- Video Replay. It allows continuous replay of captured images to observe the dynamic effects of medical procedures (e.g., barium meal).
- Reporting. It can generate and print diagnosis reports with high-quality images. Many report templates are provided.

- Image Enhancement. It provides 30+ filters to enhance images, such as Gamma adjustment, edge finding, denoising, brightening, etc.

ImagePro was tested and installed at the First Affiliated Hospital of Anhui Medical University, Hefei, China.