

Ping Chen

Computer and Mathematical
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Research Interests

Developing systems and techniques that intelligently analyze data and natural languages. Current research projects are focused on Natural Language Processing, medical data mining, text summarization, and automated disease diagnosis analysis.

Education

Doctor of Philosophy in Information Technology (Fall 1997 - Spring 2001)

George Mason University, Fairfax, VA

Advisor: Dr. Daniel Barbara

Dissertation title: Fractal clustering and its applications to projected clustering and deviation detection

Master of Science (*with honors*) in Computer science (Fall 1994 - Spring 1997)

Institute of Automation, Chinese Academy of Sciences, Beijing, China.

Advisor: Dr. Ruwei Dai, a member of Chinese Academy of Sciences

Dissertation title: Automatic Chinese Poem Generation

Bachelor of Science (*with honors*) in Information Systems (Fall 1990 - Spring 1994)

Xi'an Jiaotong University, Xi'an, China

Professional Experience

Associate Professor

September 2007 ~ present, Chair of Computer Science Program, Department of Computer and Mathematical Sciences

Director of Artificial Intelligence Lab

University of Houston-Downtown

Assistant Professor

September 2001 ~ August 2007, Department of Computer and Mathematical Sciences, University of Houston-Downtown

Research Assistant

September 1997 ~ June 2001, Department of Information and System Engineering,
George Mason University

Senior Software Developer

March 1997 ~ August 1997, sohu.com

Research Assistant

September 1995 ~ May 1997, Institute of Automation, Chinese Academy of Sciences

Journal Publications

1. P. Chen, W. Ding, C. Ding, A Lexical Knowledge Representation Model for Natural Language Understanding. *International Journal of Software Science and Computational Intelligence*, Vol. 1, No. 4, Page 17 – 35, 2009
2. H. Al-Mubaid, P. Chen, “Application of Word Prediction and Disambiguation to Improve Text Entry for People with Physical Disabilities”, *International Journal of Social and Humanistic Computing*, ISSN: 1752-6124, Vol.1 No.1, Page 10 – 27, 2008.
3. A. de Korvin, P. Chen, J. Yoon, “Information Retrieval Using Relevance Vectors: A Soft Computing Approach”, *International Journal of Pure and Applied Mathematics*, Volume 44, No. 1, 2008, 51-62.
4. K. Yue, T. A. Yang, W. Ding, P. Chen, “Open Courseware and Computer Science Education”, *Journal of Computing Sciences in Colleges*. Volume 20, Issue 1. October 2004.
5. T. Yang, K. Yue, M. Liaw, G. Collins, J. Venkatraman, S. Achar, K. Sadasivam, P. Chen, “Design of Distributed Computer Security Lab”, *Journal of Computing Sciences in Colleges*. Volume 20, Issue 1. October 2004.
6. E. Deeba, A. de Korvin, P. Chen, “Generating and applying rules for web documents retrieval”, *Far East Journal of Applied Mathematics*, vol. 16(3)(2004) P249 - 272.
7. H. Lynn, P. Chen, C. Hu, Y. Simon, “High-dimensionality 3D seismic data visualization and interpretation: Simultaneous interpretation of nine co-rendered volumes”, *the Canadian Society of Exploration Geophysicists Recorder*, Page 28-33, June 2003.
8. D. Barbara, P. Chen, “Using self-similarity to cluster large data sets”, *Journal of Knowledge Discovery and Data Mining*, 7, Page 123 – 152, 2003.

Book Chapters

9. W. Ding, P. Chen, “An Interactive Visualization Model for Large High-dimensional Datasets: A Case Study”, to appear in *Data Engineering: Mining, Information, and Intelligence*. Editors: Yupo Chan, John Talburt, Terry Talley. Springer, 2008.

10. D. Barbara, P. Chen, "Fractal Mining", in "Data Mining and Knowledge Discovery Handbook: A Complete Guide for Practitioners and Researchers", published by Kluwer Academic Publishers, Page 627-647, 2004.

11. P. Chen, W. Ding, "Knowledge Management for Agent-Based Tutoring Systems" in "Designing Distributed Learning Environments: With Intelligent Software Agents", Editor Fuhua Oscar Lin, Page 146-161, published by Idea Group, 2004.

Referred Conference Publications

12. P. Chen, W. Ding, C. Bowes*, D. Brown*, "Large-scale Dependency Knowledge Acquisition and its Extrinsic Evaluation Through Word Sense Disambiguation", the 21st IEEE International Conference on Tools with Artificial Intelligence, November 2009, New Jersey.

13. W. Ding, P. Chen, H. Al-Mubaid, M. Pomplun, "A Gaze-Controlled Interface to Virtual Reality Applications for Motor- and Speech-Impaired Users", the 13th International Conference on Human-Computer Interaction, July 2009, San Diego, CA

14. P. Chen, W. Ding, C. Bowes*, D. Brown*, "A Fully Unsupervised Word Sense Disambiguation Method and Its Evaluation on Coarse-grained All-words Task", NAACL 2009, Boulder, Colorado.

15. P. Chen, W. Ding, T. Simmons*, C. Lacayo*, "Parsing tree matching based question answering", NIST Text Analysis Conference '08, Gaithersburg, Maryland, 2008.

16. P. Chen, R. Verma, J. C. Meininger, W. Chan, "Semantic Analysis of Association Rules", the 21st AAAI International FLAIRS Conference, May 2008, Miami, Florida.

17. R. Verma, P. Chen, "Integrating Ontology Knowledge into a Query-based Information Summarization System", NIST DUC 2007, April, 2007. Rochester, NY

18. H. Lin, S. Ongard, P. Chen, "Super computing in undergraduate education", ACM & IEEE Super Computing (SC07), Reno, Nevada, November 9-13, 2007.

19. P. Chen, W. Ding, C. Ding, "SenseNet: A Knowledge Representation Model for Computational Semantics", In Proceedings of the 5th IEEE International Conference on Cognitive Informatics, July 2006, Beijing, China.

20. P. Chen, R. Verma, "A Query-based Medical Information Summarization System Using Ontology Knowledge", In Proceedings of the 19th IEEE International Symposium on Computer-Based Medical Systems, Page 37-42, June 2006, Salt Lake City, Utah.

21. P. Chen, H. Al-Mubaid, "Context-based Term Disambiguation in Biomedical Literature", In Proceedings of The 19th AAAI International FLAIRS Conference, May 2006, Melbourne, Florida.

22. C. Ding, P. Chen, "Mining Executive Compensation Data from SEC Filings", In Proceedings of IEEE ICDE Workshop on Challenges in Web Information Retrieval and Integration, Page 49-53, April, 2006, Atlanta, Georgia.
23. H. Al-Mubaid, P. Chen, "Biomedical Term Disambiguation: An Application to Gene-Protein Name Disambiguation", In Proceedings of IEEE Third International Conference on Information Technology: New Generations, page 606-612, April 2006, Las Vegas, Nevada.
24. X. Wang, P. Chen, "Web-Based Interactive Visualization of Data Cubes", In Proceedings of The 2005 IEEE International Conference on Modeling, Simulation and Visualization Methods, Page 136-143, June 2005, Las Vegas, Nevada.
25. A. de Korvin, P. Chen, C. Hu, "A Genetic Algorithm Approach for Analyzing Network Intrusion Hyperalerts", In Proceedings of The 11th World Congress of International Fuzzy Systems Association, July 2005, Beijing, China.
26. H. Al-Mubaid, P. Chen, "Context-Based Similar Words Detection and Its Application in Specialized Search Engines", In Proceedings of ACM International Conference on Intelligent User Interfaces, Page 260-264, January 2005, San Diego, CA.
27. A. de Korvin, P. Chen, C. Hu, "Generating and Applying Rules for Interval Valued Fuzzy Observations", Lecture Notes in Computer Science, Vol. 3177, Page 279-284, Springer-Verlag, 2004.
28. D. Barbara, P. Chen, "Self-similar Mining of Time Association Rules", In Proceedings of The Eighth Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD'04), Page 86-95, Sydney, Australia, May 2004.
29. K. Yue, T. Yang, W. Ding, P. Chen, "A model for open content communities to support effective learning and teaching", In Proceedings of International Conference on Web Based Communities, Lisbon, Portugal, March 2004.
30. P. Chen, C. Hu, W. Ding, H. Lynn, "Icon-based Visualization of Large High-Dimensional Datasets", In Proceedings of Third IEEE International Conference on Data Mining (ICDM'03), Page 505-508, Melbourne, Florida, November 2003.
31. P. Chen, C. Hu, H. Lynn, Y. Simon, "Visualizing High Dimensional Data", In Proceedings of Conference on Applied Research in Data Engineering 2002, Little Rock, AR, November 2002.
32. P. Chen, A. de Korvin, C. Hu, "Association Analysis with Interval Valued Fuzzy Sets and Body of Evidence", In Proceedings of 2002 IEEE International Conference on Fuzzy Systems, Page 518-523, Honolulu, HI, May 2002.
33. D. Barbara, P. Chen, "Tracking Clusters in Evolving Data Sets", In Proceedings of AAAI FLAIRS'2001, Page 239-243, Key West, FL, May 2001.
34. P. Chen, D. Wijesekera, "Hierarchical and Modular Model Checking of Finite State Machines", In Proceedings of 8th Annual IEEE International Conference and

Workshop on the Engineering of Computer Based Systems, Vienna, Virginia. April 2001.

35. D. Barbara, P. Chen, "Using the Fractal Dimension to Cluster Datasets," In Proceedings of 2000 ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, Page 260-264, Boston, MA. August 2000.

Other Publications

36. H. Lynn, P. Chen, C. Hu, Y. Simon, "Co-rendering and Interpretation of Nine 3D-attribute volumes: Case History, Central Texas, 3D PP multi-azimuth characterization of a naturally-fractured gas reservoir", invited paper by Denver Geophysical Society, November 2002.

37. P. Chen, "Fractal clustering and its applications to projected clustering and deviation detection", Ph.D. Dissertation, George Mason University, 2001

38. P. Chen, "Automatic Poem Generation with Natural Language Processing Techniques", Master Thesis, Chinese Academy of Sciences, June 1997

Research and Invited Presentations

1. "Large-scale Dependency Knowledge Acquisition and its Extrinsic Evaluation Through Word Sense Disambiguation", the 21st IEEE International Conference on Tools with Artificial Intelligence, November 2009, New Jersey.
2. "A Fully Unsupervised Word Sense Disambiguation Method and Its Evaluation on Coarse-grained All-words Task", NAACL 2009, Boulder, Colorado.
3. "Semantic Analysis of Association Rules", FLAIRS 2008. Miami, Florida, May 2008
4. "Large-scale Knowledge Acquisition and Representation", College of Software, Nankai University, China. December 2007
5. "Named Entity Recognition and Compensation Data Analysis", C.T. Bauer College of Business, University of Houston, August, 2007
6. "Semantic Association Rule Analysis", Computer Science Department, University of Houston, June, 2007
7. "SenseNet: A Knowledge Representation Model for Computational Semantics", Presentation in The 5th IEEE International Conference on Cognitive Informatics, July 2006, Beijing, China
8. "Context-based Term Disambiguation in Biomedical Literature", Presentation in The 19th International FLAIRS Conference, May 2006, Melbourne, Florida
9. "Mining Executive Compensation Data from SEC Filings", Presentation in ICDE Workshop on Challenges in Web Information Retrieval and Integration, April, 2006, Atlanta, Georgia

10. "Context-Based Similar Words Detection and Its Application in Web Search Engines", invited talk in Conference on Computer Application 2004, Houston, Texas. April 2004
11. "Icon-based Visualization of Large High-Dimensional Datasets", Third IEEE International Conference on Data Mining (ICDM'03), Melbourne, Florida, November 19-22, 2003.
12. "Visualizing Multi-Dimensional Data", 2003 ADEL Working Paper Series, January 2003.
13. "Icon-based Visualization of High-Dimensional Large Datasets", invited talk in Advanced Digital Imaging Research LLC, League City, TX, September 2002.
14. "Data Representation in Clustering", invited talk in University of Central Arkansas, Conway, AR, October 2002.
15. "Visualizing High Dimensional Data", Conference on Applied Research in Data Engineering 2002, Little Rock, AR, November 2002.
16. "Association Analysis with Interval Valued Fuzzy Sets and Body of Evidence" Proceedings of the 2002 IEEE International Conference on Fuzzy Systems, pp. 518-523, Honolulu, HI, May 2002

Patent

P. Chen, W. Ding, "Word sense disambiguation apparatus and methods", US patent pending.

Externally Sponsored Grants

1. **Project title:** VACCINE: Visual Analytics for Command, Control, Interoperability, National Security, Emergencies

Founding Agency: DHS

Principal Investigator: Richard Alo (Subaward)

Co-Principal Investigator: Ping Chen

Grant duration: 7/2009-6/2015

Award amount: \$2,109,500

2. **Project title:** Research Experiences in Algorithm Design and Analysis for Students in Undergraduate Institutions

Founding Agency: NSF

Principal Investigator: Ping Chen

Grant duration: 6/2009-5/2012

Award amount: \$308,288

3. **Project title:** An Interactive Undergraduate Data Mining Course with Industrial-Strength Projects

Founding Agency: NSF

Principal Investigator: Ping Chen

Grant duration: 4/2008-3/2010

Award amount: \$68,032

4. **Project title:** Acquisition of a Computational Cluster Grid for Research and Education in Science and Mathematics

Founding Agency: NSF

Principal Investigator: H. Lin

Co-Principal Investigator: Ping Chen

Grant duration: 9/2006-8/2009

Award amount: \$57,173

5. **Project title:** Module-Based Computer Security Courses and Laboratory for Small and Medium Sized Universities

Founding Agency: NSF

Principal Investigator: Ping Chen

Grant duration: 6/2003-5/2006

Award amount: \$50,000

6. **Project title:** Large-scale high-dimension data visualization

Founding Source: Lynn Corp.

Principal Investigator: Ping Chen

Grant duration: 6/2002-5/2003

Award amount: \$20,000

Internally Sponsored Grants (totally \$21640)

1. Faculty Development Grant, 2002, UHD
2. Faculty Development Grant, 2003, UHD
3. Faculty Development Grant, 2004, UHD
4. Faculty Development Grant, 2005, UHD
5. Faculty Development Grant, 2007, UHD
6. Organized Research Grant, 2002, UHD
7. Organized Research Grant, 2003, UHD
8. Organized Research Grant, 2006, UHD
9. Organized Research Grant, 2008, UHD

Honors and Awards

- Pi Mu Epsilon, 2009
- Faculty Research Award finalist, University of Houston-Downtown, 2007
- IT&E Doctoral Fellowship Award, George Mason University, 2000, 2001

- Honorable mention at ACM SIGKDD, 2000
- Highest honors for top graduating student at Chinese Academy of Sciences, 1997
- Elite Award of Chinese Academy of Sciences, Chinese Academy of Sciences, 1995
- Highest honors for top graduating student at Xi'an Jiao Tong University, 1994

Teaching

A. Courses Taught

1. Lower Level (Freshman and Sophomore):
Introduction to Computer Technology, Introduction to Computer Science with C++, Introduction to Data Structures and Algorithms.
2. Upper Level (Junior and Senior):
Introduction to Computer Organization and Assembly Language, Object-Oriented Programming and Concepts, Computer Systems Architecture, Web Programming, Software Engineering, Computer Security, Theory of Database and File Structures, Data Mining and Data Warehousing, Human Computer Interaction, Senior Project.

B. Instructional Development

1. Develop a new B.S. degree on Information Technology, 2008
2. Set up an undergraduate research lab, 2006
3. Develop a new course CS 4325 Human Computer Interaction, 2005
4. Develop a new course CS 3318 Introduction to Computer Security, 2003
5. Develop a new course CS 4319 Data Mining and Data Warehousing, 2002

C. Senior Projects and Theses Supervised

1. Task Management System, Philip Stackable, Fall 2001
2. Production Process for Manufacturer, Mien Trong Nguyen, Fall 2001
3. Arto-Mexico, Jose Montantes, Spring 2002
4. Hyperlink Extractions and Analysis, Beyene Tiginesh, Fall 2002
5. The Sabara Shop Database Project, Tona Raissa, Fall 2002
6. Automatic appointment scheduler system, Larry Garner, Spring 2003
7. The field of Bioinformatics, David Del Torro, Fall 2003
8. Company Executive Report System, Arron Stone, Fall 2004
9. EBao.com: An E-commerce Website, Bao Tran, Fall 2005
10. Terminal Services Security, Adnane Kidari, Spring 2006

11. VoIP and Asterisk, Muhammad Hassan, Spring 2006
12. Visualization of Optimization Strategies, Robert Anthony, Spring 2006
13. Rootkits: A Look Through the Vail, Aaron Murray, Fall 2006
14. Knowledge Representation and Acquisition with MINIPAR, Christopher Bowes, Spring 2007
15. Lexical Knowledge Acquisition with Cluster, Gabriel Williams, Fall 2008
16. Numerical Information Extraction and Analysis, James Griffin, Spring 2009
17. Assignment of ICD-9-CM Codes to Clinical-Free Text, Araly Barrera, Spring 2009
18. Text Visualization, Justin Rundell, Summer 2009
19. Word Sense Disambiguation, David Brown, Fall 2009

D. Student Publications Supervised

1. Chris Bowes, "Computational Semantics", UHD Annual Student Research Conference, 2005. Poster presentation.
2. Adnane Kidari, "Terminal Services Security", UHD Annual Student Research Conference, 2006. Oral presentation.
3. Muhammad Hassan, "VoIP and Asterisk", UHD Annual Student Research Conference, 2006. Poster presentation.
4. Christopher Bowes, Liem Luong, "Knowledge Representation and Semantic Networking using Dependency Parser (MINIPAR)", UHD Annual Student Research Conference, 2007. Oral presentation.
5. Nghia Tran and Gabriel Williams, "Password Security Methods", UHD Annual Student Research Conference, 2007. Poster presentation.
6. Liem Luong, "Word Similarity and Word Sense Disambiguate in Semantic Network", SACNAS National Conference, 2007. Poster presentation.
7. Araly Barrera, "Assignment of ICD-9-CM Codes from Clinical-Free Medical Text", CAHSI Annual Conference, 2008. Poster session.
8. Carlos Lacayo, "Parsing tree matching based question answering", CAHSI Annual Conference, 2008. Poster session.
9. Rebecca Kern, "Collection of Collocation Events in Natural Language Processing", UHD Annual Student Research Conference, 2009

Professional Service

A. University Service

1. International Education Committee, 2009-present

2. Faculty Affairs Committee, 2009-present
3. Academic Assessment Committee, 2007-2009
4. General Policy Committee, 2008-present
5. University Grievance Committee, 2008-present
6. Computer Science Program Chair, 2007-present
7. Parking Violations and Appeals Committee, 2006-2007
8. Scholarship for Future Students committee, 2006-2007
9. CS Academic Screening Committee, 2005 -2006
10. Library Committee, 2004-2006
11. Student Publications Committee, 2004-2006
12. ACM UHD chapter faculty advisor, 2004-2006
13. Faculty Senate, 2001-2003
14. ACM Programming Contests, Judge, 2002, 2003, 2004, 2005, 2007
15. Math Search Committee, 2002-2003
16. Computer Science Search Committee, 2001-2002

B. Journal Review

1. Editorial Board Member for Journal of Emerging Technologies in Web Intelligence
2. International Journal of Artificial Intelligence Tools
3. International Journal of Data Mining and Bioinformatics
4. International Journal of Software Science and Computational Intelligence
5. Journal of the American Society for Information Science and Technology
6. Journal of Artificial Intelligence in Medicine
7. Data and Knowledge Engineering Journal
8. Review Board Member for the International Journal of Computational Science
9. International Journal of Computers and Their Applications
10. Journal of Applied Soft Computing
11. International Journal of Computational Intelligence Research
12. Journal of VLSI Signal Processing-Systems for Signal, Image, and Video Technology
13. Institute of Industrial Engineers (IIE) Transactions

C. Conference Program Committee

1. ACM SIGCSE 2010 (Session Chair)

2. Session Chair in ITCAI 2009
3. 2009 Workshop on Social Networks, Applications, and Systems, Boston
4. Session Chair in IEEE Workshop on Automation and Robotics (WAR) 2008
5. IEEE Conference on Video and Signal Based Surveillance 2008
6. The Fourth International Conference on Autonomic and Autonomous Systems (Knowledge-based User Interface Program)
7. 2007 International Conference on Machine Learning and Applications
8. 16th International Conference on Software Engineering and Data Engineering 2007
9. International Conference of Information Technology Next Generation 2007
10. Workshop on Privacy and Security Aspects of Data Mining Held in Conjunction with the Fifth Institute of Electrical and Electronics Engineers (IEEE) International Conference on Data Mining (ICDM 2005)
11. Fifth International Conference on Intelligent Data Engineering and Automated Learning (IDEAL'04)
12. Workshop on Privacy and Security Aspects of Data Mining Held in Conjunction with the Fourth IEEE International Conference on Data Mining (ICDM 2004)

D. Grant Proposal Review Panel

- NSF REU Proposal Review Panel, Dec. 2009

Reference

- 1. Dr. Daniel Barbará, Professor, Computer Science Department**
George Mason University, 4400 University Drive, Fairfax, VA 22030
Homepage: www.ise.gmu.edu/~dbarbara/
E-mail: dbarbara@ise.gmu.edu Phone: (703) 993-1627 Fax: (703) 993-1638
- 2. Dr. Wenyaw Chan, Professor, Biostatistics**
University of Texas Health Science Center at Houston, Houston, Texas 77030
Homepage: myprofile.cos.com/chanw35
E-mail: Wenyaw.Chan@uth.tmc.edu Phone: (713) 500-9321 Fax: (713) 500-9530
- 3. Dr. Guozhu Dong, Professor, Department of Computer Science and Engineering**
Wright State University, 3640 Colonel Glenn Hwy. Dayton, OH 45435
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- 4. Dr. Janet C. Meininger, Professor, Division Head, Nursing System Technology**
University of Texas Health Science Center at Houston, Houston, Texas 77030
Homepage: myprofile.cos.com/meiningj75
E-mail: Janet.C.Meininger@uth.tmc.edu Phone:(713)500-2142 Fax: (713) 500-2142
- 5. Dr. Rakesh M. Verma, Professor, Computer Science Department**
University Of Houston, 4800 Calhoun Road, Houston, Texas 77004
Homepage: www2.cs.uh.edu/~rmverma/
E-mail: rmverma@cs.uh.edu Phone: (713) 743-3348 Fax: (713) 743-3335
- 6. Dr. Yu-lin Xu, Senior Scientist, Orbital Debris Group**
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