

# Curriculum Vitae

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## EDUCATION

Ph.D. (Computer Science) University of Southern California (1989)  
M.Sc. (Computer Science) University of Southern California (1985)  
B.Eng. (Computer Science and Engineering) Shanghai JiaoTong University, China (1983)

## PROFESSIONAL EXPERIENCE

Professor, 8/09 -  
Computer Science & Engineering, SCIDSE, Arizona State University, Tempe, AZ 85287.  
Associate Professor, 1/00 to 8/09, *tenured*  
Computer Science & Engineering, SCI, Arizona State University, Tempe, AZ 85287.  
ASEE AAFP Fellow, 6/07 to 8/07 AFRL, Rome, NY 13441.  
Consultant, 6/05 to 8/05 AOL, Dulles, VA 20166.  
Faculty Fellow, 7/00 to 8/00 Human Interface Lab, Motorola Labs, Tempe, AZ 85284.  
Associate Professor/Senior/Lecturer, 1/99, 1/96, 1/94 to 10/00, *tenured*  
School of Computing, National University of Singapore, Singapore 119260.  
Project Leader, 6/92 to 1/94 and Senior/Scientist, 11/89 to 1/94  
Artificial Intelligence Systems Section, Customer Services and Systems Branch  
Telstra Research Laboratories, 770 Blackburn Road, Clayton, Vic 3168, Australia.

## RESEARCH INTERESTS

- Feature Selection and Extraction, Subspace Clustering, Human-Assisted Machine Learning
- Social Computing, Identifying Influential Bloggers, Searching for “Familiar Strangers”, Auto-Tagging
- Group Profiling and Interactions, Taxonomy Adaptation, Text Categorization, Web Mining
- Multi-Source Data Integration, Model Selection, Machine Learning, AI
- Data Collection, Web Analytics, Data Preprocessing, Data Mining

The *Researcher of the Year* award, Department of Computer Science & Engineering, School of Computing and Informatics, Arizona State University, April 2009.

## TEACHING EXPERIENCE

The *Teacher of the Year* award, Department of Computer Science & Engineering, Arizona State University, April 2005.

- Social Computing and Web Analytics (CSE494/598, ASU) (created in 2008)
- Introduction to AI (CSE 471/598, ASU)
- Computing Ethics (CSE 301, ASU)
- Introduction to Data Mining (CSE 494, ASU) (created in 2003 with an NSF grant)
- Data Mining (CSE 572, ASU) (created in 2000)
- Concepts of Computing (CSE 200, ASU)
- Machine Learning and Neural Networks (CSE 3244, NUS) (created in 1995)
- Algorithms and Data Structures (IC 2101, NUS)
- Advanced Topics: Data Mining and Data Warehousing (IC 52c2, NUS)
- Introduction to Artificial Intelligence (CS 205A, NUS)

*The largest number of students in a class: ~500 students at NUS, and ~90 students at ASU.*

#### **SUPERVISION of Ph.D. STUDENTS**

1. Lei Yu, Redundancy-based Feature Selection for High-Dimensional and Application in Bioinformatics, Summer 2005, SUNY Binghamton, Assistant Professor.
2. Manoranjan Dash, Efficient Clustering for Knowledge Discovery in Large High-Dimensional Databases, June 2002, Nanyang Technological University, Assistant Professor.
3. Nitin Agarwal, Social Computing on Blogosphere, Summer 2009, University of Arkansas at Little Rock, Assistant Professor.
4. Sai Moturu, Quantifying the Trustworthiness of User-Generated Social Media Content, Summer 2009, Post Doc jointly funded by DMML, ASU and Media Lab, MIT.
5. Lei Tang, Adaptive Group Profiling and Group Evolution, Thesis Proposal Defense in Fall 2008, plan to graduate in 2009.
6. Zheng Zhao, Spectral Feature Selection, Thesis Proposal Defense in Fall 2008, plan to graduate in 2009.
7. Magdiel Galan, Mining Stream Data, Thesis Proposal Defense in Fall 2008, plan to graduate in 2009.
8. Steven Day, Multi-database Integration and Mining, in progress.
9. Somnath Shahapurkar, Unsupervised Feature Selection and Clustering, in progress.
10. Xufei Wang, Web and Text Mining, in progress.
11. Reza Zafarani, Ph.D. Summer 2009, Mining across Social Media
12. Salem Alelyani, Ph.D. Summer 2009, Feature Selection
13. Geoffrey Barbier, Ph.D. Fall 2009, Verification and Validation in Social Computing

14. Ali Abbasi, Ph.D. Fall 2009, Social Computing

## **SUPERVISION of MASTER'S STUDENTS**

1. William Cole, Opinion Mining, in progress.
2. Gayathri Varadarajan, Collective Computation based Data Mining for Prognostics and Health Management, in progress.
3. Shamanth Kumar, Comparative Mining in Blogosphere, in progress.
4. Shankara Bhargav Subramanya, View Completion using Multi-Source Data, graduated July 2008, Amazon.
5. Sanjay Sundararajan, (MCS) Analysis of Group Interaction on Blogosphere, graduated Spring 2008, Progressive.
6. Payam Refaeilzadeh, Semi-supervised Feature Selection, graduated Spring 2007, Microsoft Redmond.
7. Ashutosh Tiwari, (MCS), Clustering of Stream Data, graduated Spring 2007.
8. Niyati Parikh, Event Detection from Heterogeneous Data in Sensor Networks, Fall 2006.
9. Lance Parsons, Integrated Learning from Microarrays - Discovering Subtypes of Glioblastoma, Fall 2006.
10. Surendra Singhi, Selection Bias in Machine Learning, graduated Fall 2005.
11. Magdiel Galan, (MCS) Instance Selection for Stream Data, Summer 2005, continued in ASU Ph.D. program.
12. Ehtesham Haque, Subspace Search for Web Mining Applications, Fall 2004
13. Srihari Venkatesan, Intelligent Driving Data Analysis, Fall 2004, Yahoo!.
14. Jigar Mody, Selective Voting for Ensemble Methods, Spring 2004, Microsoft Redmond.
15. Amit Mandivikar, Active Learning for Image Mining, Fall 2003, Microsoft Redmond.
16. Deepak Kolippakkam, View Validation for Image Mining, Fall 2003, Roskamp Institute (Bioinformatics).
17. Snehal Kundalkar, (MCS) Intelligent Data Extraction, Fall 2003.
18. Reshma Suvarna, Using Meta Data and Namespaces in Data Mining, Spring 2003, HP.
19. Jianhua Han, (MCS) Meta Data and RDF in Data Mining, Spring 2002
20. Dimuthu Prasanna Makawita, Sampling from Databases Using B<sup>+</sup>Trees, 2000.
21. Kian Sing Ng, Real World Applications of Data Mining, 1999.
22. Ying Lu, On Multivariate Discretization, 1999.
23. Jun Yao, Process View of KDD: Techniques for Multiple Stages of KDD, 1998.

24. Manoranjan Dash, Feature Selection - A Preprocessing Step in Data Mining Graduated, 1998.

*Also served on numerous PhD and MS thesis committees, and as an external Ph.D. and Master's thesis reviewer for universities in Australia, Hong Kong, and Singapore.*

## **SUPERVISION of UNDERGRADUATE STUDENTS**

1. David Weber, Honors Project, *Identifying Communities in Disguise*, co-supervisor, 2008.
2. Daniel Casey, student research project, *Adaptive Stream Sampling for Sensors*, Spring 2005.
3. Andrew B. Call, project, *Case Study in Data Warehousing*, Spring 2004.
4. Robert Fitzgerald, Honors Project (incomplete *An Examination of of Selection Bias in Machine Learning*, 2003.
5. Bret Ehlert, Honors Project, *Active Feature Selection*, Fall 2000.
6. Jian Shu, Honors Thesis, *Feature Discretization and Evaluation*, 1998.
7. Yin Yin Chong, Honors Thesis, *Feature Selection Techniques and Visual Aids*, 1995.
8. Boon Poh Lee, Honors Thesis, *An Active Planner in Multi-Media Environment*, 1995.

## **GRANTS AND PROJECTS**

- III-Medium: A Machine Learning Approach to Computational Understanding of Skill Criteria in Surgical Training, NSF (001319), co-PI, 07/15/2009 - 06/30/2013, \$874,484, 30%.
- Developing Cultural Analysis and Sociological Network Theory for Understanding Virtual Communities, Collaborative Project, University of Hawaii/AFOSR, PI, 01/01/2009 - 12/31/2012, \$480,983, 100%. Approved for funding.
- Online Social Behaviors and Prediction of their Implications for the Physical World: A Comparative Study, Part 1, 06/01/2009 - 11/31/2011, Collaborative Project, University of Hawaii/ONR, PI, \$259,144, 100%. Approved for funding.
- NSF REU Grant for III-COR-Small: Beyond Feature Selection and Extraction - An Integrated Framework for High-Dimensional Data of Small Labeled Samples, NSF, IIS (0936275), PI, 4/29/2009 -. \$16,000, 50%.
- DHS COE in Border Security and Immigration - Effective Reduction of High False Alarm Rates, (University of Arizona is the lead institute), 7/1/2008 - 6/30/2012
- Second International Workshop on Social Computing, Behavioral Modeling, and Prediction. HHS-NIH-NIGMS-National Institute of General Medical Sciences (R13GM087995), PI, 3/16/09 - 3/15/10, \$12,000, 100%.
- Conference Sponsorship: Second International Workshop on Social Computing, Behavioral Modeling, and Prediction, ONR, PI, 12/01/2008 - 05/30/2009, \$5,000, 100%.
- NSF Workshop Sponsorship for the Second International Workshop on Social Computing, Behavioral Modeling, and Prediction, NSF, 01/15/009 - 12/31/2009, \$2,000, 100%.

- A Collective-Computation Approach to Prognostics Health Management, NASA, PI, 09/01/2008 - 08/31/2009, \$200,000, 34%
- III-COR-Small: Beyond Feature Selection and Extraction - An Integrated Framework for High-Dimensional Data of Small Labeled Samples, NSF, PI, 8/2008 - 7/2011, \$430,626, 50%
- Modeling Group Interaction via Open Data Sources, AFOSR, PI, 3/2008 - 2/2011, \$459,510, 100%.
- BlogTrackers: Combining Domain Knowledge and Novel Search Capabilities for Assessing Political Risks, ONR, 1/2008 - 10/2009, \$186,000, 70%.
- Link Mining of Textual Data, MITRE, PI, 9/2007-8/2008, \$50,000, 100%.
- DeepSearch for for Modeling Group Interaction Using Open Data Sources, Air Force Research Labs, PI, 8/2007 - 12/2007, \$26,000, 100%.
- Enhanced Data Accessibility Using Web Services Technology, Arizona Water Institute, Co-PI, (PI: Kyle Carpenter), 1/2007 - 12/2007. \$50,000, 10%.
- Environmental and Economic Impacts of Material Used in Future Urban Development, Co-PI, (PI: John Crittenden), 4/2007 - 3/2008, \$400,000, Arizona Science Foundation, 6%.
- Enabling the Study of Long-Term Human and Social Dynamics, NSF (BTS 0022), Co-PI, (PI: Keith Kintigh), 9/2004 - 8/2005, \$100,000, 5%.
- Modeling Driving Data, Motorola, PI, 5/2004 - 8/2004, \$13,605, 100%.
- Synthesis of Streaming Data from Multiple Sensors via Embedded Data Extraction, CEINT, PI, 1/2004 - 8/2005, \$52,102, 100%.
- MEASURES: A Proof of Concept Demonstration (Multi-scale Environmental Analysis in Urban and Regional Ecosystems), Senior Personnel, (PI: H.J. Fernando), NSF, 8/15/04 to 7/14/05, \$100,000, 30%.
- ET-I3: Enabling Technologies for Intelligent Information Integration, Co-PI, (PI: Subbarao Kambhpati), ASU-AZ, 6/2003 - 7/2005, \$200,000, 20%.
- Intelligent Driving Data Analysis, Motorola, PI, 1/2003 - 12/2003, \$19,549, 100%.
- A Collaborative Project: Development of An Undergraduate Data Mining Course, NSF (DUE: 0231448), PI, 1/2003 - 12/2004, \$52,720, 100%.
- Intelligent Data Extraction in an Automobile Environment, IMES/FORD, PI, 9/2002 - 8/2003, \$27,000, 100%.
- Toward a Unified Taxonomy for Feature Selection, NSF (IIS: 0127815), PI, 8/2001 - 7/2002, \$54,999, 100%.
- A Data Mining Approach for Detecting Egeria in Digital Imagery, SFSU, PI, 1/2002 - 12/2003, \$101,918, 100%.

*The following projects were conducted at National University of Singapore.*

- Integrated Machine Learning Workbench for Data Mining, Japan Ministry of Education, PI (at NUS), (PI at Osaka University: Hiroshi Motoda), 1999 - 2001, about US\$100,000.
- Program of Research in Intelligent Systems, National Science and Technology Board and Ministry of Education of Singapore, Associate Director and Co-PI, (PI: Tat-Seng Chua, Co-PI: Chris Marshall), 1998 - 2000, S\$3M.
- Data Mining and Intelligent Data Analysis, National Science and Technology Board and Academic Research Council of Singapore, PI, S\$70,000, 1998-1999.
- Knowledge Discovery in Gifted Education Program, Academic Research Council of Singapore in collaboration with Singapore Ministry of Education, Co-PI, (PI: Chew-Lim Tan), S\$161,700, 1998-2000.
- *A Unified Approach to Data Mining*. Academic Research Council, PI, 1997-1998, S\$65,000.
- *A Comprehensive Computer System for Data Discretization*. National Computer Board and Academic Research Council, PI, 1995-1996, S\$68,000.
- *An Automated Tool for Knowledge Acquisition*. Academic Research Council, PI, 1994 - 1995, S\$ 70,000.

## PUBLICATIONS

*As of Feb. 26th, 2009, h-index: 33, g-index 72 (<http://www.harzing.com>); and some individual work below received 610 citations according to Google Scholar.*

### AUTHORED AND EDITED BOOKS

1. “Modeling and Data Mining in Blogosphere”, Nitin Agarwal and Huan Liu, 2009, Morgan & Claypool Publishers.
2. “Social Computing and Behavioral Modeling”, edited, Huan Liu, John Salerno, and Michael Young, 2009, Springer, USA.
3. “Proceedings of the 2009 SIAM International Conference on Data Mining”, edited, H. Park, P. Srinivasan, H. Liu, and Z. Obradovic, 2009, Society for Industrial and Applied Mathematics, USA.
4. “Social Computing, Behavioral Modeling, and Prediction”, edited, Huan Liu, John Salerno, and Michael Young, 2008, Springer, USA.
5. “Computational Methods of Feature Selection”, edited, Huan Liu and Hiroshi Motoda, 2007, Chapman and Hall/CRC Press.
6. “Advances in Knowledge Discovery and Data Mining”, the 9th Pacific-Asia Conference, PAKDD 2005, Hanoi, Vietnam, May 18-20, 2005, Proceedings. Series: Lecture Notes in Computer Science, Subseries: Lecture Notes in Artificial Intelligence, Vol. 3518. Ho, Tu Bao; Cheung, David; Liu, Huan (Eds.) Springer Verlag.
7. “Instance Selection and Construction for Data Mining”, edited, (with H. Motoda), February 2001, Kluwer Academic Publishers.

8. “Knowledge Discovery and Data Mining - Current Issues and New Applications”, Proceedings of the 4th Pacific-Asia Conference on Knowledge Discovery and Data Mining, edited, (with T. Terano, A.L.P. Chen), April 2000, Springer Verlag.
9. “Feature Selection for Knowledge Discovery and Data Mining”, (with Hiroshi Motoda), July 1998. Kluwer Academic Publishers.
10. “Feature Extraction, Construction and Selection: A Data Mining Perspective”, edited, (with Hiroshi Motoda), July 1998, Kluwer Academic Publishers. 2nd Printing, 2001.
11. “KDD: Techniques and Applications”, Proceedings of the 1st Pacific-Asia Conference on Knowledge Discovery and Data Mining, edited, (with Hongjun Lu and Hiroshi Motoda), 23-24 February, 1997, Singapore. World Scientific.
12. “Proceedings of the 6th Australian Joint Conference on Artificial Intelligence”, edited, (with Chris Rowles and Norman Foo), 16-19 November, 1993, Melbourne, Australia. World Scientific.

#### *JOURNAL PUBLICATIONS*

1. Z. Zhao and H. Liu. “Searching for Interacting Features in Subset Selection”, *Intelligent Data Analysis - An International Journal*, forthcoming.
2. S. Moturu, W. Johnson, and H. Liu. “Predictive Risk Modeling for Forecasting High-Cost Patients: a Real-World Application Using Medicaid Data”, *International Journal of Biomedical Engineering and Technology, Special Issue on Warehousing and Mining Complex Data: Applications to Biology, Medicine, Behavior, Health and Environment*, forthcoming.
3. S. Subramanya, Z. Wang, B. Li, and H. Liu. ”Completing Missing Views for Multiple Sources of Web Media”, *International Journal of Data Mining, Modeling and Management*, 1(1):23-44, 2008.
4. N. Agarwal and H. Liu, “Blogosphere: Research Issues, Applications, and Tools”, *SIGKDD Explorations*, 10(1): 18–31, July 2008.
5. L. Tang, H. Liu, J. Zhang, N. Agarwal and J.J. Salerno. “Topic Taxonomy Adaptation for Group Profiling”, *ACM Transactions on Knowledge Discovery from Data*, 1(4): 1–28, January 2008.
6. N. Agarwal, H. Liu, and J. Zhang. “Blocking Objectional Web Contents by Leveraging Multiple Information Sources”. *SIGKDD Explorations*, 8(1): 17 - 26, June, 2006.
7. K.S. Candan, J.W. Kim, H. Liu, and R. Suvarna. “Discovering Mappings in Hierarchical Data from Multiple Sources Using the Inherent Structure”. *The Knowledge and Information Systems Journal*, 10(2): 185-210, August, 2006.
8. N. Agarwal, E. Haque, H. Liu, and L. Parsons. “A Subspace Clustering Framework for Research Group Collaboration”. *International Journal of Information Technology and Web Engineering*, 1(1): 35 – 58, January - March, 2006.
9. M. Berens, H. Liu, L. Parsons, L. Yu, and Z. Zhao. “Fostering Biological Relevance in Feature Selection for Microarray Data”, *Trends and Controversies, IEEE Intelligent Systems*, 20(6): 71-73, November/December 2005.

10. H. Liu and L. Yu. "Toward Integrating Feature Selection Algorithms for Classification and Clustering", *IEEE Trans. on Knowledge and Data Engineering*, 17(4): 491 – 502, 2005.
11. L. Yu and H. Liu. "Efficient Feature Selection via Analysis of Relevance and Redundancy", *Journal of Machine Learning Research*, JMLR 5 (Oct): 1205–1224, 2004.
12. H. Liu, H. Motoda, and L. Yu. "A Selective Sampling Approach to Active Feature Selection", *Artificial Intelligence*, Elsevier, 159(1-2):49-74, 2004.
13. P. Foschi and H. Liu. "Active Learning for Detecting a Spectrally Variable Subject in Color Infrared Imagery", *Pattern Recognition Letters*, Elsevier, 25(13): 1509-1517, 2004.
14. L. Parson, E. Haque, and H. Liu. "Subspace Clustering for High Dimensional Data - A Review", *SIGKDD Explorations*, 6(1): 90 – 105, June 2004.
15. M. Dash and H. Liu. "Consistency-Based Search in Feature Selection", *Artificial Intelligence*. 151(1-2):155-176, December 2003.
16. D. Makawita, K-L. Tan, and H. Liu. "Sampling from Databases Using B+Trees", *Intelligent Data Analysis*, 6(4): 359-377, 2002.
17. M. Dash, H. Liu, P. Scheuermann, and K-L. Tan. "Fast Hierarchical Clustering and Its Validation", *Data and Knowledge Engineering*, Elsevier Science. 44(1):111-140. Dec, 2002
18. Z. Chen, F. Lin, H. Liu, W.Y. Ma, Liu Wenyin. "User Intention Modelling in Web Applications Using Data Mining", *World Wide Web - Internet and Web Information Systems Journal*, Kluwer Academic Publishers. 5(3):181-192. 2002
19. H. Liu, F. Hussain, C.L. Tan, and M. Dash. "Discretization: An Enabling Technique", *Journal of Data Mining and Knowledge Discovery* 6(4): 393-423; Oct 2002.
20. H. Liu and H. Motoda, "On Issues of Instance Selection", *Journal of Data Mining and Knowledge Discovery*. 6(2):115-130; Apr 2002.
21. Z. Zhou, H. Liu, S.Z. Li, and C.S. Chua. "Rule Mining with Prior Knowledge - A Belief Networks Approach", *Intelligent Data Analysis*, 5(2):95-110, 2001.
22. K.S. Candan, H. Liu, and R. Suvarna. "Resource Description Framework: Metadata and Its Applications", *SIGKDD Explorations*, July 2001. 3(1):6-19.
23. H. Liu, H. Lu, and J. Yao, "Towards Multidatabase Mining: Identifying Relevant Databases", *IEEE Transactions on Knowledge and Data Engineering*, 13(4):541-553. July/August 2001.
24. K.S. Ng and H. Liu. "Customer Retention via Data Mining", *AI Review*, Kluwer Academic Publishers. 14(6):569-590, 2001.
25. J. Yao, M. Dash, S.T. Tan and H. Liu. "Entropy-based Fuzzy Clustering and Fuzzy Modeling", *Fuzzy Sets and Systems - International Journal of Soft Computing and Intelligence*, Official Publication of the International Fuzzy System Association, 113:381-388, Elsevier, 2000.
26. R. Setiono and H. Liu. "A Connectionist Approach to Generating Oblique Decision Trees", *IEEE Transactions on Systems, Man, and Cybernetics (Part B: Cybernetics)*, Volume 29, Number 3, pp 440 – 444, June 1999.

27. H. Liu and R. Setiono. "Some Issues on Scalable Feature Selection", *Expert Systems with Application*, pp 333 – 339. Elsevier, Volume 15, 1998.
28. R. Setiono and H. Liu. "Incremental Feature Selection", *Applied Intelligence*, Volume 9, Number 3, November/December 1998. Kluwer Academic Publishers. Pages 217-230.
29. H. Liu and H. Motoda. "Feature Transformation and Subset Selection", *IEEE Intelligent Systems*, March/April 1998, Volume 13, Number 2, Pages 26-28.
30. R. Setiono and H. Liu. "Analysis of Hidden Representations by Greedy Clustering", *Connection Science*, Vol. 10, No. 1, 1998. Carfax. pages 21-42.
31. R. Setiono and H. Liu. "NeuroLinear: From Neural Networks to Oblique Decision Rules", *Neurocomputing*, Elsevier, Vol. 17, No. 1, September 1997, pages 1-25.
32. M. Dash and H. Liu. "Feature Selection for Classification", *Intelligent Data Analysis - An International Journal*, Vol. 1, No. 3, 1997. Elsevier.
33. R. Setiono and H. Liu. "Neural Network Feature Selector", *IEEE Trans. on Neural Networks*, Vol. 8, No. 3, May 1997, pp. 654-662.
34. H. Liu and R. Setiono. "Feature Selection via Discretization of Numeric Attributes", *IEEE Trans. on Knowledge and Data Engineering*, VOL.9, NO. 4, July/August 1997. pp. 642-645.
35. H. Lu, R. Setiono, and H. Liu. "Effective Data Mining Using Neural Networks", *IEEE Trans. on Knowledge and Data Engineering*, Vol. 8, No. 6, Dec. 1996, pp. 957-961.
36. H. Liu. "Efficient Rule Induction from Noisy Data", *Expert Systems with Applications: An International Journal*, Vol. 10, No. 2, 1996. Pergamon. pp. 275-280.
37. R. Setiono and H. Liu. "Symbolic Representation of Neural Networks", *IEEE Computer*, Mar. 1996, pp 71-77.
38. H. Liu and Setiono. "Dimensionality Reduction via Discretization", *Knowledge-Based Systems*, Vol. 9, No. 1, Feb. 1996. Elsevier. pp. 67-72.
39. R. Setiono and H. Liu. "Improving Backpropagation Learning with Feature Selection", *Applied Intelligence*, Kluwer Academic Publishers, 1996. pp 129-139.
40. H. Liu and W.X. Wen. "Supervised Learning for Self-Generating Neural Networks", *Australian Journal of Intelligent Information Processing Systems*. Vol. 2, No. 2, Winter 1995. pp 12-19.
41. H. Liu, C. Rowles and W. Wen. "Critics for Knowledge-Based Design Systems", *IEEE Transactions on Knowledge and Data Engineering*, Vol. 7, NO. 5, Oct. 1995. pp 740-750.
42. H. Liu and W.X. Wen. "Joint Concept Formation", *International Journal of Knowledge Acquisition*, Vol. 6, 1994. pp 75-87.
43. G.A. Bekey, H. Liu, R. Tomovic and W.J. Karplus. "Knowledge-Based Control of Grasping in Robot Hands Using Heuristics from Human Motor Skills", *IEEE Transactions on Robotics and Automation*, Vol.9, No.6, Dec. 1993. pp 709-722.
44. A. Jennings, H. Higuchi and H. Liu. "A Personal News Service based on a User Model Neural Network", *Australian Telecommunications Research*, Vol. 27, No.1, 1993. pp 1-12.

45. A. Jennings, C. Rowles, C. Leckie and H. Liu. "AI Applications in Telecommunications", Telecommunications Journal of Australia, Vol. 41, No. 1, 1991, Australia. pp 47-55.
46. H. Liu, T. Iberall and G.A. Bekey. "Neural Network Architecture for Robot Hand Control", the IEEE Control Systems, April 1989. pp 38-43.
47. K. Rao, H. Liu, G. Medioni and G.A. Bekey. "Shape Description and Grasping for Robot Hand and Eye Coordination", the IEEE Control Systems, Feb. 1989. pp 22-29.

*BOOK CHAPTERS and ENCYCLOPEDIA ENTRIES*

1. N. Agarwal, H. Liu, J. Zhang. "A Study of Friendship Networks and Blogosphere", Handbook of Research on Text and Web Mining Technologies, Idea Group Inc., USA
2. N. Agarwal and H. Liu. "Trust on Blogosphere", Encyclopedia of Database Systems, Springer, Forthcoming.
3. P. Refaeilzadeh, L. Tang, and H. Liu. "Cross-Validation", Encyclopedia of Database Systems, Springer, Forthcoming.
4. H. Liu. "Feature Selection: An Overview", Encyclopedia of Machine Learning, Springer, Forthcoming.
5. H. Liu and Z. Zhao. "Manipulating Data and Dimension Reduction Methods: Feature Selection", Encyclopedia of Complexity and System Science, Springer, Forthcoming.
6. N. Agarwal, H. Liu, J.J. Salerno, P.S. Yu. "Searching for 'Familiar Strangers' on Blogosphere", Next Generation of Data Mining Editors: Hillol Kargupta, Jiawei Han, Philip Yu, Rajeev Motwani, Vipin Kumar, CRC Press, Chapman and Hall/CRC Press, pp 295 - 315, 2009.
7. M. Dash and H. Liu. "Dimensionality Reduction", in Encyclopedia of Computer Science and Engineering, John Wiley & Sons, Inc. Volume 2, pages 958-966. The ISBN for the 5-Volume set is 978-0-471-38393-2. Benjamin W. Wah, Editor, published in Hoboken, NJ, January 2009.
8. Z. Zhao and H. Liu. "On Interacting Features in Subset Selection", in Encyclopedia of Data Warehousing and Mining, 2nd Edition, Idea Group, Inc. pp 1079 – 1084, September, 2008.
9. L. Tang, H. Liu, and J. Zhang. "Taxonomy Adaptation for Hierarchical Content Categorization", in Encyclopedia of Data Warehousing and Mining, 2nd Edition, Idea Group, Inc. pp 178 – 182, September, 2008.
10. S. Moturu, L. Parsons, Z. Zhao, and H. Liu. "Integrative Data Analysis for Biological Discovery", in Encyclopedia of Data Warehousing and Mining, 2nd Edition, Idea Group, Inc. pp 1058 – 1065, September, 2008.
11. K.S. Candan, J.W. Kim, H. Liu, R. Suvarna, and N. Agarwal. "Spatial Transformations for Identifying Mappings in Hierarchical Media Data", in Multimedia Data Mining and Knowledge Discovery, Editors: Valery A. Petrushin and Latifur Khan, Springer, 2006.
12. L. Yu and H. Liu. "Data Mining Methods for Microarray Data Analysis", in Encyclopedia of Data Warehousing and Mining, Editor: John Wang, Idea Group Inc. 2005.
13. H. Liu and L. Yu, "Instance Selection", in Encyclopedia of Data Warehousing and Mining, Editor: John Wang, Idea Group Inc. 2005.

14. H. Liu, A. Mandvikar, and P.G. Foschi. “An Active Learning Approach to Egeria densa Detection in Digital Imagery”, *New Generation of Data Mining Applications*, IEEE/Wiley, 2005.
15. H. Liu, H. Motoda, and L. Yu. “Feature Extraction, Selection, and Construction”, in *The Handbook of Data Mining*, Lawrence Erlbaum Associates, Inc. Publishers. Editor: N. Ye. PP 409 - 423. 2003.
16. “Feature Selection”, (with Hiroshi Motoda), contribution to *Handbook of Data Mining and Knowledge Discovery*, Oxford University Press, New York. Editors: W. Klossgen and J. Zytkow. 2002.
17. “Feature Aggregation”, (with Hiroshi Motoda), contribution to *Handbook of Data Mining and Knowledge Discovery*, Oxford University Press, New York. Editors: W. Klossgen and J. Zytkow. 2002.
18. “Data Reduction via Instance Selection”, (with Hiroshi Motoda), in *Instance Selection and Construction for Data Mining*, Editors: H. Liu and H. Motoda, Kluwer Academic Publishers, Boston, USA, 2001.
19. “Sampling: Knowing Whole from Its Part”, (with Baohua Gu and Feifang Hu), in *Instance Selection and Construction for Data Mining*, Editors: H. Liu and H. Motoda, Kluwer Academic Publishers, Boston, USA, 2001.
20. “Unsupervised Feature Ranking and Selection”, (with Manoranjan Dash), in *Selected Aspects of Knowledge Discovery for Business Information Systems*. Editors: W. Abramowicz and J. Zurada, Kluwer Academic Publishers, Boston, USA, 2000.
21. “Less Is More”, (with H. Motoda), in *Feature Extraction, Construction and Selection: A Data Mining Perspective*, Kluwer Academic Publishers, Boston, USA. Pages: 3 - 12. Editors: H. Liu and H. Motoda. July 1998.
22. “Feature Extraction via Neural Networks”, (with R. Setiono), in *Feature Extraction, Construction and Selection: A Data Mining Perspective*, Kluwer Academic Publishers, Boston, USA. Pages: 191 - 204. Editors: H. Liu and H. Motoda. July 1998.
23. “A Family of Efficient Rule Generators”, *Encyclopedia of Computer Science and Technology*, Volume 39, Marcel Dekker, Inc., New York. Editors: Allen Kent and James G. Williams. 1998.

#### *CONFERENCE PUBLICATIONS*

1. Z. Zhao, L. Sun, S. Yu, H. Liu, J. Ye. “Multiclass Probabilistic Kernel Discriminant Analysis”, *IJCAI’09*
2. L. Tang and H. Liu. “Relational Learning via Latent Social Dimension”, *Poster Paper, KDD’09*.
3. N. Agarwal, H. Liu, S. Murthy, A. Sen, X. Wang. “A Social Identity Approach to Identify Familiar Strangers in a Social Network”, *Third International Conference on Weblogs and Social Media (ICWSM09)*, Full Paper, May 17 - 20, 2009, San Jose, California.
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*Ph.D. THESIS*

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*TECHNICAL REPORTS*

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9. L. Tang and H. Liu, "Bia Analysis in Text Classification for Highly Skewed Data", Technical Report, TR-05-008, Department of Computer Science and Engineering, Arizona State University, Tempe, AZ 85287, 2005.
10. L. Yu, J. Rennert, H. Liu, and M.E. Berens, "Exploiting Statistical Redundancy in Expression Microarray Data to Foster Biological Relevance", Technical Report, TR-05-005, Department of Computer Science and Engineering, Arizona State University, Tempe, AZ 85287, 2005.
11. D. Kolippakkam, H. Liu, A. Joy, C. Beaudry, M.E. Berens, "An Image Mining Approach for Measuring Intensity, Size and Geographical localization of Stained Bodies in Cultured Cells: Application in Apoptosis Detection", Technical Report, TR-03-010, Department of Computer Science and Engineering, Arizona State University, Tempe, AZ 85287, 2003.
12. B. Gu, F. Hu, and H. Liu, "Sampling and Its Applications in Data Mining: A Survey", School of Computing, National University of Singapore, Technical Report, TRA6-00, 2000.
13. F. Hussain, H. Liu, C.L. Tan, and M. Dash, "Discretization: An Enabling Technique", Technical Report, TRC6/99, School of Computing, National University of Singapore, June, 1999.
14. N.A. Syed, H. Liu and K.K. Sung, "From Incremental Learning to Model Independent Instance Selection - A Support Vector Machine Approach", Technical Report, TRA9/99, School of Computing, National University of Singapore, September, 1999.

## Book Reviews

1. “Machine Learning, Neural and Statistical Classification” edited by D. Michie, D.J. Spielhalter and C.C. Taylor. SIGART BULLETIN, - A Quarterly Publication of ACM, vol.7 no.1. (January 1996):16.
2. “Neural Networks for Statistical Modeling” by M. Smith. The Australian Computer Journal, vol. 25, no. 4 (November 1993): 165.
3. “AI in Engineering Design” edited by C. Tsong and D. Sriram. The Australian Computer Journal, vol. 25, no. 4 (November 1993): 163.

## INVITED TALKS

- “Searching for ‘Familiar Strangers’ in Blogosphere”, Annual Workshop on Information Assurance Research and Education, Information Assurance Center, Arizona State University, May 6, 2009.
- “Searching for Influencers and ‘Familiar Strangers’ in Blogosphere”, Navy Center for Applied Research in Artificial Intelligence, Naval Research Lab, NCARAI 2008-2009 Seminar Series, April 20, 2009.
- “Blogosphere, Communities, and Influential Bloggers”, University of Southern California, November 18, 2008.
- “Prognostics Health Management and Data Mining”, Adaptive Intelligent Materials and Systems (AIMS) Center Research Forum, Ira A. Fulton School of Engineering, Arizona State University, November 12, 2008.
- “Data Mining and Social Computing - Moving Forward in Interdisciplinary Research”, Computer Science and Engineering, Faculty Seminar Series, September 26, 2008
- “Data Mining and Machine Learning Overview”, Ira A. Fulton School Engineering, Research and Graduates Service Research Breakfast Forum on Computing and Informatics, September 24, 2008
- “Blogosphere: An Open Data Source for Social Cultural Research”, The AFOSR Workshop on Mathematical Process of Social-Cultural Modeling, Santa Barbara, September 4, 2008
- “Blog Community and Influential Bloggers”, Computer Science Department, University of California, Santa Barbara, September 2, 2008
- “Finding Influential Bloggers in a Community”, Microsoft Research, October 29, 2007
- “Searching for ‘Familiar Strangers’ on Blogosphere”, Microsoft AdCenter, October 29, 2007.
- “Evolving Feature Selection”, IBM T.J. Watson Research Center, July 6, 2007.
- “Online Group Interactions”, Air Force Research Lab, Rome, NY, June 22, 2007.
- “Active Feature Selection with Large Amounts of Data” M2004, The 7th Annual Data Mining Technology Conference, October, 2004.

- “Steganography and Data Mining”, IEEE Computer Society Phoenix, March, 2005.
- “An Introduction to Steganography with a Case Study of Steganalysis”, Lockheed-Martin and ASU Seminar, November, 2004.
- “Mining Learning and Assisting”, Microsoft Research Asia, July, 2004.
- “Data Mining and Data Warehousing”, Microsoft Research China, 2001.
- “Feature Selection and Instance Selection for Data Mining”, Management Information Systems, University of Arizona, October, 2000.
- “Feature Selection and Instance Selection”, Motorola Research Labs, June, 2000.
- “Feature Selection for Data Mining”, Microsoft Research China, 1999.
- “How the Service Industry Has Used Data Mining for Better Customer Service Management and Profitability”, Data Warehousing and Data Mining Conference – Using Information Technology to Achieve Business Goals, Asia Business Forum, 25 - 26 January 1999, Singapore.
- “A Brief Introduction of AI”, Singapore Ministry of Education Gifted Education Program 1998.
- “Preprocessing Tasks in Data Mining”, Kansai Advanced Research Center, Japan, May, 1997.
- “Data Mining and Applications”, Computer Science and Engineering, Kyushu Institute of Technology, Japan, May, 1997.
- “Feature Selection for Machine Learning”, Graduate School of Systems Management, The University of Tsukuba, Tokyo, Japan, May 1997.
- “Feature Selection for Machine Learning”, Computer Science, Tokyo Institute of Technology, Japan, May 1997.
- “An Approach to Verifying Knowledge Bases”, Computer Science Department, Monash University, Clayton, Australia, April, 1993.
- “Using Features in Concept Learning and Formation”, Robotics and Digital Technology Department, Monash University, Clayton, Australia, March, 1993.
- “Acquiring Knowledge through Concept Formation”, Systems Engineering Department, The Chinese University of Hong Kong, Hong Kong, March, 1993.
- “Planning with Intentions”, Computer Science Department, Hong Kong University of Science and Technology, Hong Kong. October, 1992.
- “Joint Concept Formation and Abstraction”, Computer Science Department, Hong Kong University, Hong Kong. September, 1992.
- “Concept Formation”, Computer Science Department, National University of Singapore, Singapore. September, 1992.
- “Applying Artificial Intelligence (AI) to Telecommunications”, Computer Science Department, Australia National University, Canberra, Australia. June, 1991.

- “AI in Telecommunications Networks Design”, Computer Science Department, University of Southern California, Los Angeles, U.S.A. Feb. 1991.
- “Grasping, Intentions and Planning”, Communications Research Laboratory, Kansai Advanced Research Center, Japan. Nov. 1990.
- “Some Cognitive Processes in Problem Solving”, (with Helga Rowe from ACER, Melbourne), at the Cognitive Science Meeting in Psychology and Computer Science Departments, Melbourne University, Melbourne, Australia. Oct. 1990.

## **PROFESSIONAL ACTIVITIES**

### EDITORIAL BOARD/ASSOCIATE EDITOR/ADVISORY BOARD

- Editorial Board, Applied Intelligence, 2006 -
- The Encyclopedia of Data Warehousing and Mining, Idea Group, Inc. 2004 -;
- The Handbook of Data Mining, Lawrence Erlbaum Associates, Inc. Publishers, 2002 - 2004;
- Knowledge and Information Systems, 2003 - 2006;
- Informatica - An International Journal of Computing and Informatics, 1999 -;

### CONFERENCE PROGRAM COMMITTEE CO-CHAIR, AND OTHERS

- SIAM International Conference on Data Mining (SDM'09), PC co-chair, 2009.
- The Second International Workshop on Social Computing, Behavioral Modeling, and Prediction (SBP), Co-organizer, 2009
- International Workshop on Feature Selection for Data Mining (FSDM), Co-organizer, 2008
- The First International Workshop on Social Computing, Behavioral Modeling, and Prediction (SBP), Co-organizer, 2008
- The 12th Pacific Asia Conference on Knowledge Discovery and Data Mining (PAKDD), Conference Co-Chair, 2008
- SIAM International Conference on Data Mining (SDM'08) 2008, Workshop Chair
- The 11th Pacific Asia Conference on Knowledge Discovery and Data Mining (PAKDD), PC Area Chair, 2007
- SIAM International Conference on Data Mining (SDM) 2007, Tutorial Chair
- The Second Feature Selection for Data Mining Workshop (FSDM) 2006, Co-Chair
- Pacific Rim International Conference on AI (PRICAI), PC Vice Chair, 2006
- The Tenth Pacific Asia Conference on Knowledge Discovery and Data Mining (PAKDD) 2006, Workshop Co-Chair
- PAKDD Distinguished Contribution Awards Committee member (2005, 2006)

- The Seventh Web-Age Information Management Conference (WAIM) 2006, Publicity Co-Chair
- The Ninth Pacific Asia Conference on Knowledge Discovery and Data Mining (PAKDD) 2005, PC Co-Chair
- The Symposium on Applications and Internet (SAINT) 2005, Proceedings Co-Chair
- The First Feature Selection for Data Mining Workshop (FSDM) 2005, Co-Chair
- Pacific Rim International Conference on AI (PRICAI) 2000, Workshop Chair
- The Sixth Pacific Asia Conference on Knowledge Discovery and Data Mining (PAKDD) 2002, Workshop Chair
- IJCAI 2001 Workshop on Wrapper Methods, Workshop Co-Chair
- The Fourth Pacific Asia Conference on Knowledge Discovery and Data Mining (PAKDD) 2000, PC Co-Chair
- The First Pacific Asia Conference on Knowledge Discovery and Data Mining (PAKDD) 1997, Publicity Chair
- The Sixth Australian Joint Conference on AI 1993, Organizing Co-Chair

#### GUEST EDITOR/CO-EDITOR

- Social Computing in the Blogosphere, co-editor with Philip Yu and Nitin Agarwal, IEEE Internet Computing, 2010
- Social Computing, Behavioral Modeling, and Prediction, co-editor with John Salerno, Michael Young, Rakesh Agrawal, and Philip Yu, ACM Transactions on Knowledge Discovery from Data, 2008
- Mining Streaming Data, co-editor with Jianping Zhang and Paul Wong, Journal of Information Sciences, Elsevier, 2006
- Evolving Feature Selection, IEEE Intelligent Systems, Trends and Controversies, November/December, 2005
- Instance Selection, Journal of Data Mining and Knowledge Discovery, co-editor with Hiroshi Motoda, 2001
- Feature Transformation and Subset Selection, co-editor with Hiroshi Motoda, IEEE Intelligent Systems, March/April, 1998.

#### CONFERENCE TUTORIAL

- The 14th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD'08), co-presenter, Blogosphere: Research Issues, Applications, and Tools
- SIAM Data Mining (SDM) 2007, Dimensionality Reduction for Data Mining - Techniques, Applications, and Trends

- National Conference on AI (AAAI) 2005, co-presenter, Downsizing High-Dimensional Data for High Performance
- PRICAI 1998, co-presenter, Data Mining: Process and Techniques

PROGRAM COMMITTEE MEMBER (RECENT AND SELECTED)

- AAAI-09 Spring Symposium on Technosocial Predictive Analytics, 2009.
- International Conference on Pattern Recognition, 2008
- European Conference on Machine Learning/Practical Knowledge Discovery and Data Mining (ECML/PKDD), 2008, Antwerp, Belgium.
- ECML PKDD 2008 Workshop on New Challenges for Feature Selection in Data Mining and Knowledge Discovery (FSDM08), 2008, Antwerp, Belgium.
- International World Wide Web Conference, 2008
- International Workshop on Social Computing, Behavioral Modeling, and Prediction (SBP), 2008, 2009
- International Conference on Machine Learning (ICML) 2000, 2005, 2006, 2008
- ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD) 2000, 2006, 2007, 2008 (Senior PC member)
- Conference on Information and Knowledge Management (CIKM) 2006, 2007, 2008
- SIAM International Conference on Data Mining (SDM) 2005, 2006, 2007, 2008
- Pacific Asia Conference on Knowledge Discovery and Data Mining (PAKDD), Best Papers Award Committee 2006
- Pacific Asia Conference on Knowledge Discovery and Data Mining (PAKDD) 1997 - 2008
- International Conference on Data Mining (ICDM) 2001 - 2007
- National Conference on AI (AAAI) 2007, 2008
- IEEE Symposium on Computer Intelligence and Data Mining (CIDM) 2007
- (Senior PC member), National Conference on AI (AAAI) 2005
- European Conference on Machine Learning (ECML) 2005
- International Conference, EC-Web, 2001 - 2007
- Asia Pacific Web Conference (APWeb), 2003 - 2005
- WebKDD, 2005, 2006, 2007, 2008
- Web-Age Information Management Conference (WAIM) 2001 - 2004, 2008
- Pacific Knowledge Acquisition Workshop (PKAW), 1998, 2002, 2004
- ICML 2002 Workshop on Data Mining Lessons Learned

- SIAM 2002 Workshop on Web Analytics
- ICDM Workshop on Active Mining, 2002 - 2004

STEERING COMMITTEE MEMBER

Pacific-Asia Conference Series on Knowledge Discovery and Data Mining, 1998 - present.

REVIEWING FOR JOURNALS

- Data Mining and Knowledge Discovery
- Journal of AI Research
- Journal Machine Learning Research
- Machine Learning
- Bioinformatics
- Journal of Intelligent Material Systems and Structures
- IEEE IEEE/ACM Trans on Computational Biology and Bioinformatics
- IEEE Trans. on Pattern Recognition and Machine Intelligence
- IEEE Trans. on Knowledge and Data Engineering
- IEEE Trans. on Systems, Man, and Cybernetics
- IEEE Trans. on Neural Networks
- IEEE Trans. on Evolutionary Computing
- IEEE Trans. on Signal Processing
- Pattern Recognition
- Pattern Recognition Letters
- Knowledge and Information Systems
- Neurocomputing
- Applied Intelligence
- Multimedia Systems Journal
- ASME Trans. Journal of Computing and Information Science in Engineering
- Computers and Mathematics with Applications
- Decision Support Systems
- New Generation Computing
- Information Processing Letters,

- Journal of Decision Support Systems,
- International Journal of Computer Science and Applications
- Journal of Intelligent Information Systems
- International Journal of Adaptive Control and Signal Processing
- Informatica
- Data and Knowledge Engineering (DKE)

#### REVIEWING FOR BOOKS

- Chapman & Hall/CRC
- John Wiley & Sons, Inc.
- Springer
- IEEE Press

#### GRANT PROPOSAL REVIEW/PANEL

- National Science Foundation, 2002, 2003, 2004, 2007, 2009
- AFOSR, 2009
- ARO, 2009
- NASA, 2004
- Hong Kong Research Grants Council, 2001, 2002, 2005-2009,
- Science Foundation Ireland, 2001

#### **UNIVERSITY SERVICES**

- ASU University Senate 2007 - 2009
- CSE Personnel Committee, Fall 2001, Spring 2002, 2008 -
- CSE Graduate Admission Committee Spring 2000 - Spring 2001, Fall 2002, Spring 2003 - Spring 2005 (Chair), Spring 2008 -
- CSE Executive Committee 2003 - 2004, 2005 - 2007, Spring 2008.
- CSE TA Selection Committee, Spring, 2002,
- CSE Faculty Sabbatical Committee, Fall 2000 - Spring 2003,
- Fulton School Senate, Fall 2003 - Fall 2006

*The following duties were performed at National University of Singapore (1994 - 1999)*

Curriculum Committee	Member, Advisor for the field of Humans and Computers.
Student Exchange Program Coordinator	establishing exchange programs with leading overseas universities, sending and receiving exchange students.
Student Industrial Attachment Program	liason with industrial organizations for student final year on-site projects.
Work Improvement Teams	constantly improving the working environment.
Quotation/Tender Opening Committee	checking all school equipment purchasing quotations.
Social and Recreation Committee	organizing activities to promote better relationship among staff and students.

## **PROFESSIONAL ASSOCIATIONS**

- American Association of AI (AAAI)
- Association for Computing Machinery (ACM)
- Senior member of the Institute of Electrical and Electronics Engineers (IEEE)
- American Society for Engineering Education (ASEE)

Invited to **Google Faculty Summit**, July 24-25, 2008.