

## **ANIL K. JAIN**

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### **Education**

Ph. D.	Electrical Engineering, Ohio State University	1973
M. S.	Electrical Engineering, Ohio State University	1970
B. Tech. (with Distinction)	Electrical Engineering, Indian Institute of Technology, Kanpur	1969

### **Employment**

1992 -  
University Distinguished Professor, Michigan State University  
1995 - 1999  
Chair, Department of Computer Science & Engineering, Michigan State University  
1982 -  
Professor, Department of Computer Science, Michigan State University  
1977 - 1982  
Associate Professor, Department of Computer Science, Michigan State University  
1980 - 1981  
Program Director, Intelligent Systems Program, National Science Foundation, Washington, D.C.  
1974 - 1977  
Assistant Professor, Department of Computer Science, Michigan State University  
1972 - 1974  
Assistant Professor, Department of Computer Science, Wayne State University  
1969 - 1972  
Graduate Research Assistant, Department of Electrical Engineering, Ohio State University

#### Visiting Appointments

Korea University; Tsinghua University; Hong Kong Polytechnic University; ETH, Zurich; University of Bonn; Technical University of Lisbon; University of Oslo; IBM T.J. Watson Research Center; Hong Kong University of Science and Technology; Osaka University; Norwegian Computing Center; Tata Research Development and Design Center, India; Delft Technical University.

### **Awards and Recognition**

- Member, Research Grants Council (Engineering), Hong Kong
- Member, Defense Science Board, 2008-2010
- ICDM Research Contribution Award, 2008
- King-Sun Fu Prize, International Association of Pattern Recognition, 2008
- IEEE W. Wallace McDowell Award, 2007
- Member, Biometrics Defense Support Team, 2007-2008
- Member, National Academies Panel on "Improvised Explosive Devices", 2005-
- Member, National Academies Panel on "Whither Biometrics", 2004-2008
- Fellow, SPIE, 2005
- Fellow, AAAS, 2005
- Withrow Distinguished Scholar Award, Michigan State University, 2006
- 2003 IEEE Computer Society Technical Achievement Award
- 2003 PSP Award from the Association of American Publishers for the book *Handbook of Fingerprint Recognition*

- Fellow, ACM, 2003
- Alexander von Humboldt Research Award, 2002
- Pierre Devijver Award, International Association of Pattern Recognition, 2002
- John Simon Guggenheim Fellow, 2001
- Fulbright Research Scholar, 1998
- ACM National Lecturer, 1997-98
- Ohio State University, College of Engineering Distinguished Alumnus Award, May 1997
- Member, IEEE Computer Society Golden Core, 1997
- Meritorious Service Award, IEEE Computer Society, Feb. 1996
- Fellow, IAPR (International Association of Pattern Recognition), 1996
- Distinguished Visitor, IEEE Computer Society Asia-Pacific Lecture Program, 1994-96
- Member, IEEE Publications Board, 1989-90
- Fellow, IEEE, 1991
- Michigan State University Distinguished Faculty Award, 1989
- Member, Advisory Panel, IRIS Division, NSF, 1988-1991
- Chair, IAPR Technical Committee on Statistical Pattern Recognition, 1988-1990
- Distinguished Visitor, IEEE Computer Society, 1988-1990
- Member, IEEE SMC Society Executive Committee, 1985-87
- Member, IEEE TAB Periodicals Committee, 1988-90
- Merit Scholar, Indian Institute of Technology, 1967
- National Merit Scholar, Government of India, 1963

## Paper Awards

- Int'l Conf. on Biometrics (ICB), Best Paper Award (with Y. Chen), Alghero, June 2009
- Int'l Conf. Pattern Recognition (ICPR), Best Paper Award (with A. Nagar and K. Nandakumar) Tampa, Dec. 2008
- Biometrics Research Symposium (BYSM), Best Paper Award (with J-E. Lee and R. Jin), Tampa, Sept. 2008
- Pacific-Rim Conference on Multimedia (PCM), Best Paper Award in Multimedia Systems and Applications (with J. Lee and R. Jin), Hong Kong, Dec. 2007
- Biometrics Research Symposium (BYSM), Best Paper Award (with Y. Chen) , Baltimore, Sept. 2007
- Intl. Assoc. for Pattern Recognition (IAPR), Best Paper Award in Pattern Recognition & Basic Technologies (with A. Fred), Hong Kong, August 2006
- Int'l Conf. on Biometrics (ICB), Motorola Best Student Paper Award (with J. Fierrez-Aguilar, Y. Chen and J. Ortega-Garcia), Hong Kong, Jan 2006
- Pattern Recognition Journal, Best Paper Award (with K. Nandakumar and A. Ross), 2005
- Audio-Video Based Biometric Person Authentication (AVBPA) Conf., Identix Best Student Paper Award (with U. Uludag), Rye Brook, NY, July 2005
- SIAM Int'l Data Mining Conf. (SDM), Best Student Paper Award (with H. Law and N. Zhang), Orlando, 2004
- IEEE ICIP, Best Student Paper Award (with A. Vailaya and H.J. Zhang), Kobe, 1999
- IEEE Transactions on Neural Networks, Outstanding Paper Award (with J. Mao), June 1996
- ICDAR, Best Poster Paper Award (with O. Trier), Montreal, 1995
- Pattern Recognition Journal, Best Paper Award (with F. Farrokhnia), 1991
- Pattern Recognition Journal, Best Paper Award (with J.V. Moreau), 1987
- Certificates for Outstanding Contributions to Pattern Recognition Journal, 1976, 1979, 1992, 1997, 1998

## Major Conference and Workshop Organization

- Plenary Chair, International Conf. Pattern Recognition, Istanbul, August 2010
- General Chair (with T. Tan and S. W. Lee), International Conf. on Biometrics, Seoul, August 2007
- General Chair (with A. Fred), 7<sup>th</sup> Int'l Workshop on Pattern Recognition in Information Systems, Funchal, June 2007
- General Chair (with B. Günsel), Int'l Workshop on Multimedia Content Representation, Classification and Security, Istanbul, Sept 2006
- General Chair (with R. Chin), International Conference on Biometrics, Hong Kong, January 2006
- Program Chair (with N. Ratha), Audio Video Based Person Authentication (AVBPA), New York, July 2005
- Program Chair (with N. Ratha), SPIE Conf. on Biometric Technology for Human Identification, Orlando, April 2005
- General Chair (with R. Chin), International Conference on Biometrics, Hong Kong, July 2004

- Area Chair, CVPR '04, Washington D.C., June 2004
- Program chair (with N. Ratha), SPIE Conf. On Biometric Technology for Human Identification, Orlando, April 2004
- Program Chair (with H. Bunke), 17<sup>th</sup> International Conference on Pattern Recognition, Cambridge, 2004
- Chair (with E. Rood), NSF Workshop on “Research Agenda in Biometrics”, Morgantown, April 2003
- Chair (with M. Figueiredo and J. Zerubia), Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR 2001), Sophia-Antipolis, France
- Program Chair (with J. Kittler), 15<sup>th</sup> International Conference on Pattern Recognition, Barcelona, 2000
- General Chair (with D. Goldgof), IEEE Computer Vision and Pattern Recognition Conf. (CVPR '98), Santa Barbara
- General Program Chair (with S. Venkatesh and B. Lovell), 14<sup>th</sup> International Conference on Pattern Recognition, Brisbane, 1998
- Tutorial Chair, IEEE Computer Vision and Pattern Recognition Conf. (CVPR '96), San Diego
- General Chair, IEEE Southwest Symposium on Image Analysis and Interpretation, Dallas, April 1994
- General Chair (with E. Backer), 11th International Conference on Pattern Recognition, The Hague, Aug. 1992
- Chair (with S. Negahdaripour), NSF Workshop on “Challenges of Computer Vision”, Maui, June 1991
- General Chair, IEEE Workshop on Interpretation of 3D Scenes, Austin, Nov. 1989
- Chair (with R. Chellappa), NSF Workshop on “Theory and Applications of MRF”, San Diego, June 1989
- Chair, NSF Indo-US Workshop on Computer Research Collaboration, Hyderabad, 1988
- Chair (with R. Jain), NSF Workshop on “Range Image Understanding”, East Lansing, March 1988
- Director, NATO Advanced Research Workshop on “Real-Time Object Tracking and Classification”, Maratea, 1987

## Editorial Boards

- Associate Editor, ACM Transactions on Knowledge Discovery in Data, 2006-
- Associate Editor, IEEE Transactions on Information Forensics and Security, 2005-
- Guest Editor (with D. Zhang), Special issue of Pattern Recognition Journal on *Biometrics*, Jan. 2003
- Guest Editor (with A. Fred), Special issue of Pattern Recognition Journal on *Pattern Recognition in Information System*, Dec. 2002
- Guest Editor (with R. Bolle and S. Pankanti), IEEE Computer, Special Issue on *Biometrics*, Feb. 2000
- Guest Editor (with J. Mao), Special Issue of the IEEE Trans. Neural Networks on *Artificial Neural Networks and Statistical Pattern Recognition* Jan. 1997
- Guest Editor (with C.M. Lee), Special Issues of Pattern Recognition on *Image Database Retrieval*, April 1997
- Editor-In-Chief, IEEE Trans. Pattern Analysis and Machine Intelligence, 1991-1994
- Associate Editor, Pattern Recognition Journal, 1989-
- Associate Editor, IEEE Transactions on Pattern Analysis and Machine Intelligence, 1986-1990
- Advisory Editor, Pattern Recognition Letters, 1984-
- Associate Editor, IEEE Trans. on Neural Networks, 1994-1999
- Associate Editor, Applied Intelligence, 1990-
- Associate Editor, Journal of Mathematical Imaging and Vision, 1990-1999

## Keynote Speaker

- The third International conf. on Ethics & Policy of Biometrics (ICEB), Hong Kong, Jan 2010
- Biometric ID Management and Multimodal Communication (BioID\_MultiComm), Madrid, Sept 2009
- European Conf. Machine Learning (ECML), Antwerp, Sept. 2008
- Int'l Symposium on Data, Information & Knowledge Spectrum, Amritapuri, India, Dec. 2007
- 12<sup>th</sup> Ibero-american Congress on Pattern Recognition (CIARP), Valparaiso, Chile, Nov. 2007
- 4<sup>th</sup> Int'l Conf. on Image and Graphics (ICIG), Chengdu, China, Aug. 2007
- 5<sup>th</sup> Int'l Conf. on Machine Learning and Data Mining (MLDM), Leipzig, July 2007
- 2<sup>nd</sup> Workshop on Computer Vision, Sao Carlos, Brazil, October 2006
- 19<sup>th</sup> Brazilian Sym. on Computer Graphics, Image Processing and Computer Vision (SIBGRAPI), Manaus, Oct. 2006
- 18<sup>th</sup> International Conf. Pattern Recognition (ICPR), Hong Kong, August 2006
- International Conf. on Enterprise Information Systems, Paphos, Cyprus, May 2006
- Symposium on Cryptography and Information Security (SCIS), Hiroshima, Japan, January 2006
- 1<sup>st</sup> Int'l Conf. Pattern Recognition & Machine Intelligence, Kolkata, India, December 2005
- 13<sup>th</sup> Int'l Conf. Image Analysis and Processing (ICIAP), Cagliari, Italy, September 2005

- 14<sup>th</sup> Scandinavian Conf. Image Analysis (SCIA) 2005, Joensuu, Finland, June 2005
- Korea Computer Vision and Pattern Recognition Society Meeting, Seoul, December 2004
- NATO Workshop on Information Security, Ottawa, Oct. 2004
- MIT Technology Review, Emerging Technology Conf., Sept. 2004
- 17<sup>th</sup> Int'l Conf. Pattern Recognition (ICPR), Cambridge, England, Aug. 2004
- IEEE Signal Processing and Applications Conference (SIU), Kusadasi, Turkey, April 2004
- European Union COTS Workshop on Biometrics, Vigo, Spain, March 2004
- Sino Biometrics, Beijing, Dec. 2003
- Fifth International Conf. On Advances in Pattern Recognition, Calcutta, Dec. 2003
- Fifth International Conf. On Multimodal Interfaces (ICMI), Vancouver, Nov. 2003
- German Pattern Recognition Society Conference (DAGM03), Magdeburg, Germany, Sept. 2003
- Austrian Pattern Recognition Society Conference (OAGM), Vienna, June 2003
- Sino Biometrics, Xian, Aug. 2002
- 1<sup>st</sup> International Conference on Diagnostic Imaging and Analysis, Shanghai, Aug. 2002
- IAPR Workshop on Statistical & Structural Pattern Recognition, Windsor, Aug. 2002
- MITAC Annual Meeting, Vancouver, May 2002
- Dow Lecture, Saginaw Valley State University, Saginaw, Feb. 2002
- 3<sup>rd</sup> Audio- Video-Based Person Authentication Conf. (AVBPA), Halmstad, Sweden, June 2001
- Workshop on Texture, Oulu, Finland, June 1999
- International Symposium on Multispectral Image Analysis, Wuhan, Oct. 1998
- Computer Vision Graphics and Image Proc. Conf. (CVGIP), Taipei, Aug. 1998
- Irish Machine Vision and AI Conference, Derry, N. Ireland, Sept. 1997
- Energy Minimization Methods in Computer Vision & Pattern Recog. (EMMCVPR), Venice, May 1997
- 2nd Asian Conference on Computer Vision (ACCV), Singapore, Dec. 1995
- 8<sup>th</sup> Int'l Conference Image Analysis and Processing (ICIAP), San Remo, Sept. 1995
- IEEE World Congress on Computational Intelligence, Orlando, July 1994
- 8<sup>th</sup> Scandinavian Conference on Image Analysis (SCIA), Tromso, May 1993
- Digital Image Computing Techniques & Applications (DICTA), Melbourne, Dec. 1991
- American Association of Physicists in Medicine, San Francisco, July 1991

## Invited Talks

Tsinghua University, June 2009; Inter American Development Bank, May 2009; University of North Texas, April 2009; University of Florida, Oct 2008; Chulalongkorn University, Nov 2008; TCS, Nov 2008; Istanbul Technical University, Sept. 2008; Cogent, Aug. 2008; KMUT, Bangkok, May 2008; Chiang Mai University, Chiang Mai, May 2008; Kentucky Science and Technology Foundation, April 2008; University of Minnesota, April 2008; University of Virginia, March 2008; University of Missouri, Columbia, January 2008; CMC Ltd., Hyderabad, December 2007; Ford Motor Company, Dearborn, November 2007; Information Trust Institute, University of Illinois, Urbana-Champaign, Oct. 2007; Istanbul Technical University, Sept. 2007; Tsinghua University, Beijing, Aug. 2007; Nanyang Technological University, Singapore, March 2007; Institute of Infocomm Research, Singapore, March 2007; Wayne State University, Detroit, March 2007; General Motors Technical Center, Feb. 2007; Yonsei University, Seoul, Jan. 2007; Hong Kong Baptist University, Jan. 2007; Department of Electrical & Computer Engineering, Ohio State University, Nov. 2006; School of Computer Science, University of Central Florida, Nov. 2006; UNESP, Baurau, Brazil, Oct 2006; Federal University of Parana, Curitiba, Brazil, Oct 2006; Sichuan University, Chengdu, China, August 2006; Institute of Automation, Beijing, August 2006; Lumidigm, Albuquerque, July 2006; SAGEM, Paris, June 2006; Department of Informatics, ETH, Zurich, May 2006; University of Athens, May 2006; Aristotle University of Thessaloniki, May 2006; Kyoto University, Jan 2006; Indian Institute of Technology, Kanpur, Dec 2005; Indian Institute of Science, Bangalore, Dec 2005; Institut National Telecommunications (INT-Evry), Nov 2005; National Academy of Science Sackler Forensic Science Colloquium, Nov 2005; Dept. of Computer Science, SUNY, Buffalo, Oct 2005; Department of Electrical Engineering, Istanbul Technical University, Sept., 2005; NEC Research Labs, Princeton, July 2005; Institute of Automation, Chinese Academy of Sciences, Beijing, June 2005; Siemens Corporate Research, Princeton, Feb 2005; Symbol Technologies, Long Island, Feb 2005; Biometric Research Center, Yonsei University, Seoul, December 2004; Indian Institute of Technology, Mumbai, December 2004; CMC Research and Development Center, Hyderabad, December 2004; ATR International, Kyoto, November 2004; Department of Electrical & Computer Engineering, Carnegie Mellon University, Nov. 2004; Department of Statistics, University of Goettingen, Germany, June 2004; Department of Informatics, University of Freiburg, Germany, June 2004; Department of Computer Science, ETH, June 2004; Beckman Institute, University of Illinois, Urbana, March 2004; Department of Computer Science, Indian Institute of Technology, Kanpur, Dec. 2003; Department of Computer Science, Hong Kong Polytechnic University, Dec. 2003; Department of Computer

Science, Hong Kong University of Science & Technology, Dec. 2003; ECE Dept. Tulane University, New Orleans, Oct. 2003; CSEE Department, West Virginia University, Morgantown, Oct. 2003; "Science at the Edge" Seminar Series, Michigan State University, Sept. 2003; Philips Research Lab, Eindhoven, Sept. 2003; Department of Informatics III, University of Bonn, July 2003; Department of Computer Science, Technical University of Vienna, June 2003; Biometrics Summer School, Sardinia, June 2003; ECE Department, North Carolina State University, March 2003; Statistics Department, Florida State University, Feb. 2003; Computer Science Department, University Notre Dame, Jan. 2003; Dept. of Computer Science, Hong Kong Polytechnic University, Hong Kong Dec. 2002; Computer Science Dept., IUPUI, Indianapolis, Nov. 2002; Financial Sector Technical Committee (NIST), Alexandria, VA, Oct. 2002; Biometric Consortium (BC 2002), Crystal City, VA, Sept. 2002; Department of Computer Science, Sichuan University, Chengdu, Aug. 2002; Pierre Devijver Lecturer, Workshop on Structural & Statistical Pattern Recognition, Windsor, Aug. 2002; National Institute of Standards & Technology (NIST), June 2002; CITER, West Virginia University, April 2002; GAO Panel on Biometrics, Washington D.C., April 2002; Department of Computing, University of Alberta, March 2002; NSF Workshop on Pattern Recognition, Ann Arbor, March 2002; Department of Electrical Engineering, University of Texas, Austin, Feb. 2002; Department of Computer Science, Univ. of Bonn, Germany, Jan. 2002; Department of Computer Science, Western Michigan University, Nov. 2001; Department of Computer Science, Oakland University, Nov. 2001; Department of Electrical & Computer Engineering, MSU Sept. 2001; Department of Statistics, University of Michigan, Sept. 2001; Department of Computer Science, Hong Kong University Science & Technology, Aug. 2001; Department of Computer Science, Chulankongkorn University, Bangkok, Aug. 2001; Software Park, Bangkok, Aug. 2001; Department of Computer Science, King Mangkot University, Aug. 2001; Department of Statistics, Ohio State University, May 2001; Department of Electrical & Computer Engineering, University of Miami, Coral Gables, March 2001; National Center for Software Technology, Bombay, Dec. 4, 2000; Department of Computer Science, Indian Institute of Technology, Delhi, Dec. 1, 2000; Department of Electronic Engineering, Nanyang Technical University, Singapore, Nov. 25, 2000; National Laboratory of Pattern Recognition, Beijing, Nov. 23, 2000; Microsoft Research Laboratory, Beijing, Nov. 20-22, 2000; Eaton Corporation, Rochester Hills, Nov. 15, 2000; Department of Electrical Engineering, Istanbul Technical University, Oct. 24, 2000; Marmara Research Center, Istanbul, Oct. 23, 2000; Siemens PSE Division, Graz, Oct. 19, 2000; Siemens ICM Division, Munich, Oct. 18, 2000; Campus Interdisciplinary Seminar, MSU, Oct. 4, 2000; Lawrence Technological University, Southfield, Sept. 27, 2000; Eaton Corporation, Milwaukee, Aug. 28, 2000; West Virginia EPSCOR Workshop, Charleston, WV, Feb. 1999; University of Surrey, Guildford, England, Jan. 1999; Instituto Superior Tecnico, Lisbon, Portugal, Nov. 1998; West Virginia Science & Technology Council, Morgantown, Nov. 1998; National Laboratory for Pattern Recognition, Beijing, Oct. 1998; Academia Sinica, Taipei, Aug. 1998; National Taiwan University, Taipei, Aug. 1998; Department of Computer Science, University of Auckland, New Zealand, Aug. 1998; Department of Computer Science, New York University, March 1998; University of West Virginia, Morgantown, Jan. 1998; Department of Systems Design, University of Waterloo, Sept. 1997; LG Electronic Research Center, Princeton, Aug. 1997; School of Automation, Indian Institute of Science, Bangalore, July 1997; Bell Labs, Lucent Technologies, Naperville, July 1997; National Centre for Software Technology, Bombay, July 1997; Department of Computer Science, Sichuan Union University, Chengdu, June 1997; Department of Computer Science, Hong Kong University Science & Technology, June 1997; University of Cagliari, Italy, May 1997; Department of Computer Science, Ohio State University, May 1997; University of Indonesia, Jakarta, May 1997; NEC Research Laboratory, Princeton, Feb. 1997;

## Patents

1. A.K. Jain, L. Hong, R. Bolle and S. Pankanti, "System and Method for Deriving a string-based representation of a fingerprint image", U.S. Patent No. 6,487,306, Nov. 26, 2002
2. A.K. Jain, L. Hong, R. Bolle and S. Pankanti, "Determining A Point Correspondence Between Two Points in Two Respective (Fingerprint) Images", U.S. Patent No. 6,049,621, April 11, 2000
3. A.K. Jain, L. Hong, R. Bolle and S. Pankanti, "System and Method for Matching (Fingerprint) Images Using an Aligned String-Based Representation", U.S. Patent No. 6,185,318, Feb. 6, 2001
4. A.K. Jain, L. Hong, R. Bolle and S. Pankanti, "System and Method For Identifying Foreground And Background Portions Of Digitized Images", U.S. Patent No. 6,263,091, July 17, 2001
5. A.K. Jain, L. Hong, R. Bolle and S. Pankanti, "System and Method for Determining Block Direction in Fingerprint Images", U.S. Patent No. 6,289,112 Sept. 11, 2001
6. A.K. Jain, L. Hong, R. Bolle and S. Pankanti, "Determining An Alignment Estimation Between Two (Fingerprint) Images", U.S. Patent No. 6,314,197, Nov. 6, 2001

## Publications

### Books

1. A. K. Jain, A. Ross and P. J. Flynn (eds.), *Handbook of Biometrics*, Springer, 2007
2. A. Ross, K. Nandakumar and A.K. Jain, *Handbook of Multibiometrics*, Springer, 2006
3. S.Z. Li and A.K. Jain (eds.), *Handbook of Face Recognition*, Springer, 2005
4. J.L. Wayman, A. Jain, D. Maltoni and D. Maio (eds.), *Biometric Systems: Technology, Design and Performance Evaluation*, Springer, 2005
5. D. Maltoni, D. Maio, A.K. Jain and S. Prabhakar, *Handbook of Fingerprint Recognition*, Springer-Verlag, 2003; Second edition, 2009
6. A.K. Jain, S. Pankanti and R. Bolle (eds.), *BIOMETRICS: Personal Identification in Networked Society*, Kluwer, 1999
7. A.K. Jain and P.J. Flynn (eds.), *3D Object Recognition Systems*, Elsevier, 1993
8. R. Chellappa and A.K. Jain (eds.), *Markov Random Fields: Theory and Applications*, Academic Press, 1993
9. I. Sethi and A.K. Jain (eds.), *Neural Networks and Statistical Pattern Recognition*, North-Holland, 1991
10. R. Jain and A.K. Jain (eds.), *Analysis and Interpretation of Range Images*, Springer-Verlag, 1990
11. A.K. Jain and R.C. Dubes, *Algorithms for Clustering Data*, Prentice-Hall, 1988. **One of the top-100 all-time cited publication in computer science according to CiteSeer**

### Edited Conference / Workshop Proceedings

1. B. Gunsel, A.K. Jain, A.M. Tekalp and B. Sankur (eds.), Proc. International Workshop on Multimedia, Content Representation, Classification and Security, Springer, LNCS 4105, 2006.
2. D. Zhang and A.K. Jain (eds.), Proc. International Conference on Biometrics (ICB), Springer, LNCS 3832, 2006
3. T. Kanade, A.K. Jain and N. Ratha (eds.), Proc. Audio- Video-Based Biometric Person Authentication (AVBPA), Springer, LNCS 3546, 2005
4. A.K. Jain and N.K. Ratha (eds.), Proc. SPIE, *Biometric Technology for Human Identification II*, Vol. 5779, 2005
5. D. Maltoni and A.K. Jain (eds.), *Biometric Authentication, Proc. ECCV 2004 International Workshop (BioAW)*, Springer, LNCS 3087, 2004
6. D. Zhang and A.K. Jain (eds.), Proc. First International Conference Biometric Authentication (ICBA), Springer, LNCS 3072, 2004
7. A.K. Jain and N.K. Ratha (eds.), Proc. SPIE, *Biometric Technology for Human Identification I*, Vol. 5404, 2004
8. M. Figueiredo, J. Zerubia and A.K. Jain (eds.), *Energy minimization Methods in Computer Vision and Pattern Recognition*, Springer-Verlag, LNCS 2134, 2001
9. A.K. Jain (ed.), *Real-Time Object Measurement and Classification*, Springer-Verlag, 1988

### Book Chapters

1. T. Lange, M. Law, A. K. Jain and M. Buhmann, "Clustering with Constraints: A Mean-field Approximation Perspective", in *Constrained Clustering*, S. Basu, I. Davison and K. L. Wagstaff (eds.), CRC Press, 2008.
2. A. Ross and A. K. Jain, "Fusion Techniques in Multibiometric Systems", in *Face Biometrics for Personal Identification*, R. I. Hammound, B. R. Abidi and M. A. Abidi (eds.), Springer, 2007.
3. A. K. Jain and U. Uludag, "Biometrics and Digital Rights Management", in *Multimedia Security Technologies for Digital Rights Management*, Wenjun Zeng, Heather Yu, Ching-Yung Lin (eds), pp. 197-218, Academic Press, 2006.
4. A.K. Jain, K. Nandakumar, U. Uludag and X. Lu, "Multimodal Biometrics: Augmenting Face With Other Cues", in *Face Processing: Advanced Modeling and Methods*, W. Zhao and R. Chellappa (eds.), pp. 679-705, Academic Press, 2005.
5. A. Ross and A. K. Jain, "Multimodal Human Recognition Systems", in *Multi-Sensor Image Fusion and Its Application*. R.S. Blum and Z. Liu (eds.), Taylor & Francis, 2005.
6. A. K. Jain and A. Ross, "Biometrics", in the *Encyclopedia of Cryptography and Security*, Henk C. A. van Tilborg (ed.), Springer, 2005.
7. A.K. Jain and R.P.W. Duin, "Pattern Recognition", in *Oxford Mind Encyclopedia*, R. Gregory (ed.), Oxford University Press, 2004.
8. S. Prabhakar and A.K. Jain, "Fingerprint Matching," in *Advances in Fingerprint Recognition*. N. Ratha and R. Bolle (eds.), Springer, 2003.
9. A.K. Jain, "Biometrics", Microsoft *Encarta*, on-line edition, 2001.
10. A.K. Jain and S. Pankanti, "Automatic Fingerprint Identification Systems", in *Advances in Fingerprint Sciences*, R.E. Gaensslen and H. Lee (eds.), pp. 275-326, CRC Press, 2001.
11. A.K. Jain and S. Pankanti, "Fingerprint Matching and Classification", in *Handbook of Image Processing*, A. Bovik (ed.), pp. 821-835, Academic Press, 2000.
12. M. Figueiredo, J. Leitaó and A.K. Jain, "On Fitting Mixture Models", in *Energy Minimization Methods in Computer Vision and Pattern Recognition*, eds. E. Hancock and M. Pellillo, Springer-Verlag, 1999.
13. A.K. Jain and P. Flynn, "Image Segmentation Using Clustering", in *Advances in Image Understanding*, K. Bowyer and N. Ahuja (eds.), IEEE Computer Society Press, pp. 65-83, 1996.
14. N. Ratha, A.K. Jain and D. Rover, "Fingerprint Matching on Splash 2" in *Splash 2: FPGAs in a Custom Computing Machine*, D. Buell, J. Arnold and W. Kleinfolder (eds.), IEEE Computer Society Press, pp. 117-140, 1996.
15. A.K. Jain and J. Mao, "Neural Networks and Pattern Recognition", in *Computational Intelligence for Imitating Life*, J.M. Zurada, R.J. Marks and C.J. Robinson (eds.), IEEE Press, pp. 194-212, 1994.
16. P. Flynn and A.K. Jain, "Three-Dimensional Object Recognition", in *Handbook of Pattern Recognition and Image Processing*, T.Y. Young (ed.), Academic Press, 1994, pp. 498-541.
17. M. Tuceryan and A.K. Jain, "Texture Analysis", in *Handbook of Pattern Recognition and Computer Vision*, C.H. Chen, et al. (eds.), World Scientific Publishing Co., 1993, pp. 235-276.
18. A.K. Jain and S. Nadabar, "Markov Random Field Applications in Image Analysis", in *Data Analysis in Astronomy IV*, Di Gesu et al. (eds.), Plenum Press, 1992, pp. 39-50.
19. A.K. Jain, "Bootstrap Techniques in Statistical Pattern Recognition", in *Systems and Signal Processing*, R.N. Madan et al. (eds.), Oxford and IBH Publishing Co., 1991, pp. 525-534.
20. S. Raudys and A.K. Jain, "Small Sample Size Problems in Designing Artificial Neural Networks", in *Neural Networks and Statistical Pattern Recognition*, I. Sethi and A.K. Jain (eds.), North-Holland, 1991, pp. 33-50.
21. S. Nadabar and A.K. Jain, "Range Image Segmentation Using MRF Models", in *Markov Random Fields: Theory and*

*Applications*, R. Chellappa and A.K. Jain (eds.), Academic Press, 1993, pp. 543-572.

22. A.K. Jain and M.D. Ramaswami, "Classifier Design with Parzen Windows", in *Pattern Recognition and Artificial Intelligence*, E.S. Gelsema and L.N. Kanal (eds.), North-Holland, 1988, pp. 211-228.
23. A.K. Jain, "Pattern Recognition", in *Encyclopedia of Robotics*, R.C. Dorf (ed.), Wiley, 1988, pp. 1052-1063.
24. A.K. Jain, "Advances in Statistical Pattern Recognition", in *Pattern Recognition Theory and Applications*, P.A. Devijver and J. Kittler (eds.), Springer-Verlag, 1987, pp. 1-19.
25. A.K. Jain and J.V. Moreau, "The Bootstrap Approach to Clustering", in *Pattern Recognition Theory and Applications*, P.A. Devijver and J. Kittler (eds.), Springer-Verlag, 1987, pp. 63-71.
26. A.K. Jain, "Cluster Analysis", in *Handbook of Pattern Recognition and Image Processing*, T.Y. Young and K.S. Fu (eds.), Academic Press, 1987, pp. 35-57.
27. L. Ni and A.K. Jain, "Design of a Pattern Cluster using Two-Level Pipelined Systolic Array", in *VLSI for Pattern Recognition and Image Processing*, K.S. Fu (ed.), Springer-Verlag, 1984, pp. 65-83.
28. A.K. Jain and B. Chandrasekaran, "Dimensionality and Sample Size Considerations in Pattern Recognition Practice", *Handbook of Statistics*, Vol. II, P. R. Krishnaiah and L.N. Kanal (eds.), North-Holland, 1982, pp. 835-855.
29. N. Wyse, R. Dubes and A.K. Jain, "A Critical Review of Intrinsic Dimensionality Algorithms", in *Pattern Recognition in Practice*, E.S. Gelsema and L.N. Kanal (eds.), North-Holland, 1980, pp. 415-425.
30. R. Dubes and A.K. Jain, "Clustering Methodologies in Exploratory Data Analysis", in *Advances in Computers*, Vol. 19, M. Yovits (ed.), Academic Press, 1980, pp. 113-228.

## Journal Articles

1. A.K. Jain, "Data Clustering: 50 Years Beyond K-Means", *Pattern Recognition Letters (To appear)*.
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214. M.-P. Dubuisson and A.K. Jain, "A Modified Hausdorff Distance for Object Matching", Proc. 12th Int'l. Conf. on Pattern Recognition, pp. 566-568, Oct. 1994, Jerusalem.
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216. D. Judd, N. Ratha, P. McKinley, A.K. Jain and J. Weng, "Parallel Implementation of Vision Algorithms on Workstation Clusters", Proc. 12th Int'l. Conf. on Pattern Recognition, pp. 317-321, Oct. 1994, Jerusalem.
217. C. Dorai, J. Weng and A.K. Jain, "Optimal Registration of Multiple Range Views", Proc. 12th Int'l. Conf. on Pattern Recognition, pp. 569-571, Oct. 1994, Jerusalem.
218. B. Günsel, A.K. Jain and E. Panayirci, "Boundary Detection Using Multiscale Markov Random Fields", Proc. 12th Int'l. Conf. on Pattern Recognition, pp. 173-177, Oct. 1994, Jerusalem.
219. M.-P. Dubuisson and A.K. Jain, "Matching Vehicles for Travel Time Estimation", IEEE Intelligent Vehicle Symposium, pp. 266-271, Oct. 1994, Paris, France.
220. N. Ratha, S. Lakshmanan and A.K. Jain, "Object Detection in the Presence of Clutter Using Gabor Filters", Proc. SPIE Symposium on Applications of Digital Image Processing XVII, San Diego, CA, July 1994, pp. 612-619.
221. K. Karu and A.K. Jain, "Learning Texture Discrimination Masks", Proc. IEEE Conf. Neural Networks, pp. 4374-4379, June 1994, Orlando.
222. J. Mao and A.K. Jain, "A Self-Organizing Network for Hyperellipsoidal Clustering (HEC)", Proc. IEEE Conf. Neural Networks, pp. 2967-2972, June 1994, Orlando.
223. S. Pankanti, M. Tuceryan and A.K. Jain, "On Integration of Vision Modules", Proc. IEEE Computer Vision and Pattern Recognition Conference, pp. 316-322, June 1994, Seattle.
224. M.-P. Dubuisson and A.K. Jain, "2D Matching of 3D Moving Objects in Color Outdoor Scenes", Proc. IEEE Computer Vision and Pattern Recognition Conference, pp. 887-891, June 1994, Seattle.
225. J. Courtney and A.K. Jain, "Mobile Robot Localization via Classification of Multisensor Maps", Proc. IEEE International Conference on Robotics and Automation, May 8-13, 1994, pp. 1672-1678, San Diego.
226. T. Newman and A.K. Jain, "Bidirectional Template Matching for 3D CAD-Based Inspection", Proc. SPIE Conf. on Machine Vision Applications in Industrial Vision II, Feb. 1994.
227. T. Newman and A.K. Jain, "CAD-Based Inspection of 3D Objects Using Range Images", Proc. 2nd IEEE CAD-Based Vision Workshop, Champion, PA, pp. 236-243, Feb. 1994.
228. J. Mao, P.J. Flynn and A.K. Jain, "Integration of Multiple Feature Groups and Multiple Views into a 3D Object Recognition System", Proc. 2nd IEEE CAD-Based Vision Workshop, Champion, PA, pp. 184-191, Feb. 1994.

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230. H. Dulimarta and A.K. Jain, "Modular Agents for Robot Navigation", Proc. SPIE Sensor Fusion VI Conference, Boston, Vol. 2059, Sept. 1993.
231. J. Mao and A.K. Jain, "Regularization Techniques in Artificial Neural Networks", Proc. World Congress on Neural Networks, Vol. 4, Portland, pp. 75-79, July 1993.
232. C. Dorai, S. Pankanti and A.K. Jain, "Robust Feature Detection for 3D Object Recognition and Matching", Proc. of SPIE Conference on Geometric Methods in Computer Vision, San Diego, pp. 366-377, July 1993.
233. M.-P. Dubuisson and A.K. Jain, "Object Contour Extraction Using Color and Motion", Proc. of IEEE Computer Vision and Pattern Recognition Conference, New York, pp. 471-476, June 1993.
234. A.K. Jain, "Object Recognition Using Range Images", Proc. 8th Scandinavian Conf. on Image Analysis, Tromso, Norway, pp. 797-805, May 1993.
235. A. Solberg, T. Taxt and A.K. Jain, "Fusion of Multitemporal Satellite Images and GIS Data for Land-Use Classification", Proc. 8th Scandinavian Conf. on Image Analysis, Tromso, Norway, pp. 691-697, May 1993.
236. J. Mao and A.K. Jain, "Discriminant Analysis Neural Network", Proc. 1993 IEEE International Conf. on Neural Networks, San Francisco, Vol. 1, pp. 300-305, March 1993.
237. A.K. Jain and J. Mao, "Artificial Neural Network for Nonlinear Projection of Multivariate Data", Proc. International Joint Conference on Neural Networks '92, Baltimore, pp. III-335-III-340, June 1992.
238. A. Schistad and A.K. Jain, "Texture Analysis in the Presence of Speckle Noise", Proc Int'l Geoscience and Remote Sensing Symposium, Houston, pp. 884-886, May 1992.
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240. Q. Huang, G. Stockman and A.K. Jain, "Automatic Image Analysis of Plant Root Structures", Proc. 11th Int'l. Conference on Pattern Recognition, The Hague, pp. 569-572, Aug. 1992.
241. B. Günsel and A.K. Jain, "Visual Surface Reconstruction and Boundary Detection Using Stochastic Models", Proc. 11th Int'l. Conference on Pattern Recognition, The Hague, pp. 343-346, Aug. 1992.
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249. S. Nadabar and A.K. Jain, "Edge Detection and Labeling by Fusion of Intensity and Range Images", Proc. SPIE: Applications of Artificial Intelligence X, Orlando, vol. 1708, pp. 108-119, April 1992.
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251. T. Taxt and A.K. Jain, "Image Restoration Methods Based on Quantum Field Models", Proc. IEEE 1991 Medical Imaging Conference, Santa Fe, Nov. 1991.
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275. R. Hoffman and A.K. Jain, "An Evidence-Based 3D Vision System for Range Images", Proc. 1st. International Conference on Computer Vision, London, June 1987, pp. 521-525.
276. M. Tuceryan, Y. Lee and A.K. Jain, "Extracting Perceptual Structures in Line Patterns", Proc. 5th Scandinavian Conference on Image Analysis, Stockholm, June 1987, pp. 531-538.
277. R. Enslin, J. Ton and A.K. Jain, "Land Cover Change Detection Using a GIS-Guided, Feature-Based Classification of Landsat Thematic Mapper Data", Proc. American Society of Photogrammetry, Washington, D.C., March 1987.
278. R. Hoffman and A.K. Jain, "Evidence-based Recognition of 3D Objects", Proc. of SPIE Symposium on Electro-optic Imaging Systems & Devices, vol. 754, Los Angeles, Jan. 1987, pp. 260-267.
279. J. Coggins and A.K. Jain, "Surface Orientation from Texture", Proc. IEEE International Conference on Systems, Man, and Cybernetics, Atlanta, Oct. 1986.
280. A.K. Jain, "Computer Vision", Proc. Symposium on Microcomputers for Developing Countries, Lisbon, Oct. 1986.
281. A.K. Jain, R.C. Dubes and C.C. Chen, "Bootstrapping Techniques for Error Estimation", Proc. 8th International Conference on Pattern Recognition, Paris, Oct. 1986, pp. 330-332.
282. R. Hoffman and A.K. Jain, "Sparse Decomposition for Exploratory Pattern Analysis", Proc. 8th International Conference on Pattern Recognition, Paris, Oct. 1986, pp. 333-335.
283. G. Hu, G. Stockman and A.K. Jain, "Shape from Light Stripe Texture", Proc. IEEE Conference on Computer Vision and Pattern Recognition, Miami Beach, June 1986, pp. 412-414.
284. R. Hoffman and A.K. Jain, "Segmentation and Classification of Range Images", Proc. IEEE Conference on Computer Vision and Pattern Recognition, Miami Beach, June 1986, pp. 446-451.
285. J.V. Moreau and A.K. Jain, "How Many Clusters?", Proc. IEEE Conference on Computer Vision and Pattern Recognition, Miami Beach, June 1986, pp. 634-636.
286. A.K. Jain and R. Hoffman, "Interpretation of Range Images", Proc. Artificial Intelligence and Advanced Computer Technology Conference, Long Beach, April 1986, pp. 81-86.
287. G. Stockman and A.K. Jain, "Imaging Environment and General Image Processing Algorithms", Proc. of American Society of Agriculture Engineers Summer Meeting, East Lansing, June 1985.

288. A.K. Jain, "Experiments in Texture Analysis Using Spatial Filtering", Proc. of IEEE Workshop on Languages for Automation, Palma de Mallorca, June 1985, pp. 66-70.
289. S.P. Smith and A.K. Jain, "Test for Multivariate Normality", Proc. of IEEE Conference on Computer Vision and Pattern Recognition, San Francisco, June 1985, pp. 423-425.
290. D. Ittner and A.K. Jain, "3-D Surface Discrimination from Local Curvature Measures", Proc. of IEEE Conference on Computer Vision and Pattern Recognition, San Francisco, June 1985, pp. 119-123.
291. D. Ittner and A.K. Jain, "Segmentation of Range Data", Proc. of Artificial Intelligence and Advanced Computer Technology Conference, Long Beach, April 1985, pp. 23-28.
292. Z. You and A.K. Jain, "Performance Evaluation of Shape Matching via Chord Length Distribution", Proc. of First International Conference on Computers and Applications, Beijing, June 1984, pp. 555-562.
293. G. Cross and A.K. Jain, "Application of Image Models to Texture Homogeneity", Proc. of 1983 International Conference on Systems, Man, and Cybernetics, Bombay, Jan. 1984, pp. 24-27.
294. R. Dubes and A.K. Jain, "Are the Sensor Data Random?", Proc. of 1983 Conference on Artificial Intelligence, Rochester, Michigan, April 1983, pp. 984-991.
295. L. Ni and A.K. Jain, "A VLSI Systolic Architecture for Pattern Clustering", Proc. of IEEE Workshop on Computer Architecture for Pattern Analysis and Image Database Management, Pasadena, CA., Oct. 1983.
296. G. Cross and A.K. Jain, "Measures of Homogeneity in Textures", Proc. of IEEE Conference on Computer Vision and Pattern Recognition, Washington, D.C., June 1983, pp. 211-216.
297. S. Smith and A.K. Jain, "Testing for Uniformity in Multidimensional Data", Proc. of IEEE Conference on Computer Vision and Pattern Recognition, Washington, D.C., June 1983, pp. 166-167.
298. G. Cross, N. Wyse and A.K. Jain, "Multivariate Normality in Pattern Recognition and Clustering", Proc. 6th International Conference on Pattern Recognition, Munich, Germany, 1982, pp. 862-864.
299. A. Goshtasby, W.R. Enslin and A.K. Jain, "Automatic Digital Image Registration", Proc. Eighth International Symposium on Machine Processing of Remotely Sensed Data, West Lafayette, July 1982, pp. 347-352.
300. S. Smith and A.K. Jain, "Structure of Multidimensional Patterns", Proc. IEEE Conference on Pattern Recognition and Image Processing, Las Vegas, Nevada, June 1982, pp. 1-5.
301. G. Cross and A.K. Jain, "Recent Developments in Markovian Image Models", Proc. SOUTHEASTCON, Destin, Florida, April 1982, pp. 360-363.
302. G. Cross and A.K. Jain, "Measurement of Clustering Tendency", Proc. IFAC Symposium on Digital Control, New Delhi, Jan. 1982, pp. 24-29.
303. G. Cross and A.K. Jain, "Markov Random Field Texture Models", Proc. IEEE Conference on Pattern Recognition and Image Processing, Dallas, Aug. 1981, pp. 597-602.
304. S. Smith and A.K. Jain, "Chord Distributions for Shape Matching", Proc. IEEE Conference on Pattern Recognition and Image Processing, Dallas, Aug. 1981, pp. 168-170.
305. J. Flora, A.K. Jain and S. Smith, "Computer Classification of Eddy Current Signals for Automatic Inspection of Steam Generator Tubes", abstracted in Proc. of Workshop on Digital Signal and Waveform Analysis, Miami Beach, Dec. 1980.
306. O. Tosi, R.C. Dubes and A.K. Jain, "Speaker Identification Studies on Choral Speech", Proc. Carnahan Conference on Crime Countermeasures, Lexington, Kentucky, May 1979, pp. 150-156.
307. R. Dubes and A.K. Jain, "Models and Methods in Cluster Validity", Proc. IEEE Conference on Pattern Recognition and Image Processing, Chicago, May 1978, pp. 148-155.

308. W. Waller and A.K. Jain, "Mean Recognition Accuracy of Dependent Binary Measurements", Proc. Seventh International Conference on Cybernetics and Society, Washington, D.C., Sept. 1977, pp. 586-590.
309. E. Backer and A.K. Jain, "On Feature Ordering in Practice and Some Finite Sample Effects", Proc. Third International Joint Conference on Pattern Recognition, Coronado, California, Nov. 1976, pp. 45-49.
310. A.K. Jain and B. Chandrasekaran, "On Balancing Decision Functions", appears in the abstracts of papers presented at the 1976 International Symposium on Information Theory, Ronneby, Sweden, June 1976, p. 142.
311. A.K. Jain and B. Chandrasekaran, "Distance Functions for Independent Measurements and Finite Sample Size", Proc. Second International Joint Conference on Pattern Recognition, Lyngby, Denmark, Aug. 1974, pp. 41-42.
312. A.K. Jain and B. Chandrasekaran, "Conditions for Perfect Discrimination for Independent Measurements", Proc. of Sixth Hawaii International Conference on Systems Science, Honolulu, Jan. 1973, pp. 70-72.
313. B. Chandrasekaran and A.K. Jain, "Quantization of Independent Measurements and Recognition Performance", appears in the abstracts of papers presented at the International Symposium on Information Theory, Pacific Grove, CA, Jan. 1972.

## Short Courses

- "Biometric Recognition", 19<sup>th</sup> SIBGRAPI, Manaus, Brazil, Oct. 2006
- "Biometric Recognition", 18<sup>th</sup> ICPR, Hong Kong, Aug. 2006
- "Multimodal Biometrics", ICB, Hong Kong, Jan. 2006
- "Fingerprint Matching", Int'l Conf. Pattern Recognition & Machine Intelligence, Kolkata, Dec 2005
- "Fingerprint Matching", Croucher Advanced Study Institute, Hong Kong, Dec. 2004
- "Biometrics Recognition", 17<sup>th</sup> ICPR, Cambridge, Aug. 2004
- "Data Mining", Eaton Corporation, April 2004
- "Pattern Recognition", Eaton Corporation, April 2003
- "Biometrics Recognition", 14<sup>th</sup> ICPR, Brisbane, Aug. 1998
- "Pattern Recognition and Neural Networks", 13th ICPR, Vienna, Aug. 1996
- "Pattern Recognition and Neural Networks", 2nd ACCV, Singapore, Dec. 1995
- "Statistical Pattern Recognition", 12th ICPR, Jerusalem, Oct. 1994
- "Statistical Pattern Recognition", IEEE CVPR Conference, Seattle, June 1994
- "Artificial Neural Networks and Pattern Recognition", 11th ICPR, Hague, Aug. 1992
- "Pattern Recognition & Image Proc.", ONR U.S.-India Workshop on Biofouling, Aurangabad, Aug. 1991
- "Statistical Pattern Recognition", 10th ICPR, Atlantic City, June 1990
- "Pattern Recognition and Data Analysis", Lifelong Education, MSU, July 1989
- "Pattern Recognition", Norwegian Computing Center, Oslo, March 1987
- "Statistical Pattern Recognition", 8th ICPR, Paris, Oct. 1986
- "Statistical Pattern Recognition", 1985 IEEE CVPR Conference, San Francisco, June 1985
- "Statistical Pattern Recognition", Northrop, Anaheim, California, March 1985
- "Pattern Recognition and Image Processing", TRDDC, Pune, India, Dec. 1983 and July 1984
- "Pattern Recognition and Nondestructive Testing", Tata Electric, Bombay, India, July 1984
- "Statistical Pattern Recognition", Lear Siegler, Grand Rapids, Michigan, July 1983
- "Signal Processing", Continuing Education, MSU, Nov. 1978
- "Computer Science", High School Summer Engineering Institute, MSU, East Lansing, June 1978

## Thesis Supervision

### Ph.D. Students

1. Unsang Park, "Face Recognition: Face in Video, Age Invariance, and Facial Marks", 2009 (Michigan State University)
2. Yi Chen, "Extended Feature set and Touchless Imaging for Fingerprint Matching", 2009 (DigitalPersona0)
3. Karthik Nandakumar, "Multibiometric Systems: Fusion Strategies and Template Security", 2008 (I<sup>2</sup>R, Singapore)

4. Hong Chen, "Dental Biometrics", 2007 (EDDA Technology)
5. Xiaoguang Lu, "3D Face Recognition", 2006 (Siemens Corporate Research)
6. Martin Law, "Clustering and Dimensionality Reduction", 2006 (Google)
7. Umut Uludag, "Secure Biometric Systems", 2006 (Lumidigm)
8. Anoop Nambodiri, "On-line Handwritten Document Understanding", 2004 (IIIT, Hyderabad)
9. Michael Farmer, "Segmentation, Classification, and Tracking of Humans for Smart Airbag Applications", 2004 (University of Michigan, Flint)
10. Arun Ross, "Information Fusion in Fingerprint Authentication", 2003 (West Virginia University)
11. Rein-Lien Hsu, "Face Detection, Recognition and Tracking", 2002 (Identix)
12. Salil Prabhakar, "Fingerprint Matching and Classification Using a Filterbank", 2001 (Digital Persona)
13. Aditya Vailaya, "Semantic Classification of Images", 2000 (Retrevo)
14. Scott Connell, "On-line Cursive Handwriting Recognition", 2000 (General Dynamics)
15. Nicolae Duta, "Learning-based Detection, Segmentation and Matching of Objects", 2000 (Nuance)
16. Lin Hong, "Fingerprint Matching", 1998 (Siemens Corporate Research)
17. Yu Zhong, "Deformable Models for Object Matching", 1997 (BAE Systems)
18. Nalini Ratha, "Computer Vision Algorithms on Reconfigurable Logic Arrays", 1996 (IBM T.J. Watson Research Center)
19. Chitra Dorai, "Representation and Recognition of 3-D Objects with Free-Form Surfaces", 1996 (IBM T.J. Watson Research Center)
20. Sharathchandra Pankanti, "Integration of Vision Modules", 1995 (IBM T.J. Watson Research Center)
21. Marie-Pierre Dubuisson, "Segmentation and Matching of Vehicles from Complex Color Outdoor Scenes", 1995 (Siemens Corporate Research)
22. Jianchang Mao, "Design and Analysis of Neural Networks for Pattern Recognition", 1994 (Yahoo)
23. Hans Dulimarta, "Client Server Control Architecture for Robot Navigation", 1994 (Grand Valley State University)
24. Timothy S. Newman, "Experiments in CAD-Based Inspection", 1993 (Univ. of Alabama, Huntsville)
25. Sateesha G. Nadabar, "Markov Random Field Models in Computer Vision", 1992 (Cognex)
26. Narayan S. Raja, "Parts-Based 3D Object Recognition", 1992 (Univ. of Hawaii)
27. Farshid Farrokhnia, "Multi-Channel Filtering Techniques for Texture Segmentation and Surface Quality Inspection", 1990 (GE Medical Systems)
28. Patrick Flynn, "CAD-Based Computer Vision: Modeling and Recognition Strategies", 1990 (University of Notre Dame)
29. Jezching Ton, "A Knowledge-Based Approach to Landsat Image Interpretation", 1989 (Sync Sort)
30. Richard Hoffman, "Object Recognition From Range Images", 1986 (Northrop Grumman)
31. James Coggins, "A Framework for Texture Analysis Based on Spatial Filtering", 1982 (BAE Systems)
32. Stephen Smith, "Structure of Multidimensional Patterns", 1982 (Intel)
33. George Cross, "Markov Models of Texture", 1980 (Infotech Systems)

### M.S. Students

1. Steve Krawczyk, "Online signature and voice for Tablet PC", 2005
2. Karthik Nandakumar, "Multibiometrics", 2005
3. Umar Farooq, "Face Detection and Recognition", 1998
4. Yatin Kulkarni, "Personal Identification Using Speech, Face and Fingerprints", 1998
5. Yong Hong Li, "On-line Text Clustering and Classification", 1998
6. Prasun Sinha, "Cursive Script Postal Address Recognition", 1997
7. Aditya Vailaya, "A Hierarchical System for Efficient Image Retrieval", 1996
8. Scott Connell, "A Comparison of Hidden Markov Model Features for the Recognition of Cursive Handwriting", 1996
9. Jonathan D. Courtney, "Mobile Robot Localization Using Pattern Classification Techniques", 1993
10. Marie-Pierre Dubuisson, "Multi-Sensor Fusion for Nondestructive Inspection of Fiber Reinforced Composite Structures", 1991
11. David Gift, "Three-Dimensional Reconstruction of Backscattered Ultrasound Data", 1980
12. Chung-Pin Chi, "Necessary and Sufficient Conditions for Conditional and Unconditional Independence", 1978
13. Kevin Markle, "Assembly Line Mold Scheduling", 1977