

Curriculum Vita (2014)

Name:

J. K. Aggarwal

Address:

Department of Electrical and Computer Engineering
The University of Texas at Austin,
Austin, Texas, USA 78712

Citizenship:

USA

Education:

Ph.D., University of Illinois, Urbana, Illinois, 10/64
M.S., University of Illinois, Urbana, Illinois, 8/61
B. Eng., University of Liverpool, Liverpool, England, 6/60
B.Sc., University of Bombay, Bombay, India, 8/57

Present Position:

Cullen Trust for Higher Education Endowed Professorship in Engineering, The University of Texas at Austin, September 1990 – present.
Professor of Electrical and Computer Engineering, The University of Texas at Austin, Austin, Texas, September 1972 – present.
Professor of Computer Sciences, The University of Texas at Austin, Texas, 1980 - present.

Professional Experience:

Visiting Professor, MIT Media Lab., Spring 1995.

John J. McKetta Energy Professor of Electrical and Computer Engineering, College of Engineering, The University of Texas at Austin, September 1981 to August 1990

Visiting Professor, Kobe University, Japan, spring 1976.

Professor of Electrical and Computer Engineering, The University of Texas at Austin, Austin, Texas, September 1972 to present

Associate Professor of Electrical Engineering, The University of Texas at Austin, Austin, Texas, September 1968-1972.

Visiting Associate Professor of Electrical Engineering and Computer Science, University of California, Berkeley, California, September 1969-June 1970.

Visiting Assistant Professor, Center for Dynamical Systems, Brown University, Providence, R.I., February 1968-June 1968.

Assistant Professor of Electrical Engineering, The University of Texas at Austin, Austin, Texas, September 1964-August 1968.

Research Assistant, Coordinated Science Laboratory, University of Illinois, Urbana, Illinois, June 1961-August 1964.

Fellow, University of Illinois, Urbana, Illinois, September 1960-May 1961.

Research Assistant, Marconi's Research Laboratory, Chelmsford, England, Summer 1959.

Membership in Societies

Institute of Electrical and Electronics Engineers, and IEEE Computer Society
Eta Kappa Nu
American Association for the Advancement of Science
Association for Computing Machinery

Honors and Awards

Student/Peer Initiated Honors

COMPUTER VISION AND IMAGE UNDERSTANDING (CVIU) is an important technical journal in the area of computer vision. The Editor in Chief of the journal is Professor Avi Kak of Purdue University. A special section of the vol. 117 (10), 2013 of CVIU honors J. K. Aggarwal. The special section was edited by Professor Rama Chellappa of the University of Maryland and Professor Baba Vemuri of the University of Florida. A brief excerpt from the editorial reads "...The special section is brought to you in recognition and honor of the multi-faceted contributions of Jake to computer vision....."

An anonymous donor donated \$50,000 to The University of Texas to start an Endowed Presidential Undergraduate Scholarship in 2009 in the name of J. K. Aggarwal. This donor has contributed additional sums of \$30,000 in 2010 and \$35,000 in 2011. The endowment is supporting three scholarships in the Department of Electrical and Computer Engineering. The fund is over \$135,000 at this point.

The International Association for Pattern Recognition (IAPR) has established the J.K. Aggarwal Prize in honor of Professor J.K. Aggarwal to be awarded every two years at the time of ICPR. The award was established by contributions of several students of Professor Aggarwal. The recipient of the prize is a young scientist, under the age of 40 at the date of the deadline for nominations, who has made a substantial contribution and whose research work has had a major impact on the field. The past recipients of the Prize are: 2012 Professor Vidal, 2010 Professor Antonio Torralba 2008 Professor Song-Chun Zhu and 2006 Dr. Bernhard Scholkopf.

Elected Offices

President, International Association for Pattern Recognition, 1992-1994

Treasurer, International Association for Pattern Recognition, 1989-1992

Chairman, IEEE Computer Society's Technical Committee on Pattern Analysis and Machine Intelligence, 1987-1989

International/National Awards

Okawa Prize of the Okawa Foundation for Information and Telecommunications of Japan. The citation read " For Outstanding Contributions to Conception and Pioneering Research of Dynamic Scene Analysis and Multi-Sensor Fusion in Computer Vision Systems," November 2007

Fellow AAAS 2005.

IEEE Leon K. Kirchmayer Graduate Teaching Award, "For inspiring graduate students to achieve excellence through mentoring, teaching and guidance of research in computer vision and signal processing," June 2005.

K. S. Fu Prize, International Association for Pattern Recognition, "For pioneering contributions towards establishing the fundamentals of structure and motion from image sequences and their applications to robot vision and human motion," August, 2004.

Honorable Mention of the Pattern Recognition Society Award for Outstanding Contribution, September 2003 for the paper entitled "Image retrieval via isotropic and anisotropic mappings, (with Qasim Iqbal), Pattern Recognition, Vol. 35, No.12, pp.2673-2686, 2002.

Fellow, International Association on Pattern Recognition, 1996.

IEEE Computer Society Technical Achievement Award, for "pioneering contributions towards establishing fundamentals of structure extraction and computational motion from image sequences," 1996.

Honorable Mention of the Pattern Recognition Society Award for Outstanding Contribution, November 1993, for the paper entitled "Applying Perceptual Organization to the Detection of Man-made Objects in Non-Urban Scenes," (with H.Q. Lu), Pattern Recognition, Vol. 25, No. 8, pp. 835-853, 1992.

American Society of Engineering Education, Senior Research Award, 1992.

Phillips Award for Best Paper at the IEEE International Conference on Robotics and Automation, Nice, France 1992, for the paper "Extraction and Interpretation of Semantically Significant Line Segments for a Mobile Robot," (with X. Lebegue).

IEEE Computer Society Outstanding Paper Award, 7th Conference on Artificial Intelligence Applications 1991, for the paper "Multi-Sensor Image Interpretation Using Laser Radar and Thermal Images," (with Chen-Chau Chu).

Alumni Honor Award of the College of Engineering, the University of Illinois, April 1987.

Distinguished Alumnus of the University of Illinois, Electrical and Computer Engineering Alumni Association 1986.

Honorable Mention of the Pattern Recognition Society Award for Outstanding Contribution, May 1988, for the paper entitled "Determining Motion Parameters Using Intensity Guided Range Sensing," (with M. Magee), Pattern Recognition, Vol. 19, No. 2, pp.169-180, 1986.

Honorable Mention of the Pattern Recognition Society Award for Outstanding Contribution, December 1986, for the paper entitled "Analysis of a Model for Parallel Image Processing," (with S. Yalamanchili), Pattern Recognition, Vol. 18, No. 1, pp. 1-16, 1985.

Among the 100 Top Innovations of the Year by Science Digest for the research on "Computerized Visual Analysis for Cryopreservation of Living Cells," Science Digest, December 1985, (with K. R. Diller).

Fellow, Institute of Electrical and Electronics Engineers, 1976.

Best Paper Award, Pattern Recognition Society for the paper entitled, "Finding the Edges of the Surfaces of Three-Dimensional Curved Objects by Computer," (with J. W. McKee), 1975.

IEEE / IEEE Computer Society/Other Service Awards

IEEE Life Fellow, January 2002.

IEEE Computer Society Golden Core Member, 1997.

IEEE Computer Society Certificate of Appreciation for Outstanding service as General Chair of the 2002 Workshop on Motion and Video Computing, December 2002.

IEEE Recognition for Valued services and contributions as member of the IEEE Prize Paper/Scholarship Awards Committee, 1999-2002.

IEEE Computer Society Certificate of Appreciation for diligent and dedicated service on the IEEE Computer Society Publications Board in 1998 and 1999, February 2000.

IEEE Computer Society Certificate of Appreciation for Outstanding service as a member of the Publications Board of the IEEE Computer Society in 1998, February 1999.

IEEE Computer Society Certificate of Appreciation for Thoughtful and conscientious evaluation of Fellow candidates during service on the Fellow Evaluations Committee, November 1998.

IEEE Computer Society, Meritorious Service Award for service to the Computer Society as a member of the editorial board of IEEE Transactions on Parallel and Distributed Systems, January 1997.

IEEE Computer Society Meritorious Service Award for technical and administrative leadership as Chairman of the Technical Committee on Pattern Analysis and Machine Intelligence, November 1989.

TAB Pioneer Award, IEEE Computer Society Technical Activities Board, presented in recognition of service with distinction on COMPUSAT '88 Team, February-October 1988.

IEEE Computer Society Certificate of Appreciation for excellence as guest editor of the first issue of IEEE EXPERT, Spring 1986; December 1988.

IEEE Computer Society Certificate of Appreciation for service as Program Chairman of the First Conference on Artificial Intelligence Applications, Denver, Colorado, December 1984; June 1986.

The University of Texas at Austin Awards

Dean's Fellowship Spring 1999.

Outstanding Graduate Teacher, Graduate School, The University of Texas at Austin, 1992.

The Billy and Claude Hocott Distinguished Centennial Engineering Research Award of the College of Engineering at The University of Texas at Austin, November 1986.

This annual award is given to the engineering faculty member who has made the most significant contributions and furthered the engineering profession through noteworthy published research while at UT-Austin.

Meritorious Faculty Award of the College of Engineering for the years 1966-67, 1971-72, 1972-73, 1973-74, 1974-75, 1976-77, 1979-80, 1980-81, and 1984-85.

University Research Institute - Faculty Research Assignment for the years 1968-69, 1976-77, 1982-83 and 1994-95.

Publications

Books

Computer Vision Analysis of Image Motion by Variational Methods, Springer Verlag 2013, in the series topics in Signal Processing (with Amar Mitiche).

Combinatorial Image Analysis, (Edited with Reneta P. Barneva, Valentin Brimkov, Kostadin N. Korotchev, and Elka R. Koroutcheva), Springer Verlag 2011.

Multisensor Fusion for Computer Vision, Springer Verlag, Berlin, 1993, pp.456.

Motion Understanding: Robot and Human Vision, Kluwer Academic Publishers, 1988, (with W. Martin), pp. 432.

Deconvolution of Seismic Data, Hutchinson, Ross Publishing Company, 1982, (with V. K. Arya), pp. 308.

Digital Signal Processing, Western Periodicals Company, North Hollywood, California, 1979, pp. 357.

Computer Methods in Image Analysis, IEEE Press, 1977, (with R. O. Duda and A. Rosenfeld), pp. 466.

Nonlinear Systems: Stability Analysis, Dowden, Hutchinson, Ross, (with M. Vidyasagar), 1977, pp. 380.

Notes on Nonlinear Systems, Van Nostrand Reinhold, (George Turin, Series Editor, System-Science Notes), 1972, pp. 214.

Papers (selected):

“Human Activity Recognition From 3D Data: A Review”, Pattern Recognition Letters Special Issue in the honor of Professor Maria Petrou, 2014 (with Lu Xi)

"Spontaneous Facial Expression Recognition: A Robust Metric Learning Approach", *Pattern Recognition*, 47, (5), May 2014, 1859–1868 (with Shaohua Wan)

"Video Event Description in Scene Context", *NeuroComputing*, Special Issue on Intelligent Processing Techniques for Semantic-based Image and Video Retrieval, Jan 2013 vol.119 pp. 82-93 (with Chunmei Liu, Changbo Hu and Qingshou Liu).

"Stochastic Representation and Recognition of High-level Group Activities", *International Journal of Computer Vision (IJCV)*, 93(2):183-200, June 2011. (With M.S. Ryoo).

"A Task-Driven Intelligent Workspace System to Provide Guidance Feedback", *Computer Vision and Image Understanding (CVIU) special issue on Intelligent Vision Systems*, 114(5):520-534, May 2010 (with M. S. Ryoo, K. Grauman).

"Detecting Persons Climbing Fences", *International Journal of Pattern Recognition and Artificial Intelligence*, 23(7):1309-1332, November 2009 (with Elden Yu).

"Real-Time Illegal Parking Detection in Outdoor Environments using 1-D Transformation," *IEEE Transactions on Circuits and Systems for Video Technology*, Vol. 19, no.7 pp.1014-1024, August 2009 (with Jong T. Lee, M. S. Ryoo, Matthew Riley)

"Semantic Representation and Recognition of Continued and Recursive Human Activities," *International Journal of Computer Vision*, 2009 vol.82 pp.1-24 (with M. S. Ryoo).

"Detection of Object Abandonment using Temporal Logic", *Machine Vision and Applications*, 2009, vol. 20, pp.271-281 (with Medha Bhargava, Chia-Chih Chen, M.S. Ryoo).

"Designing an Embedded Video Processing Camera Using a 16-bit Microprocessor for a Surveillance System ", *Journal of VLSI Signal Processing* Vol. 42, pp. 57-68, March 2006 (with Koichi Sato and Brian L. Evans).

"Object tracking in an outdoor environment using fusion of features and cameras", *Image Vision Computing*, 24(11): 1244-1255 (2006) (with Quming Zhou).

"Special issue on multimedia Surveillance systems", Guest Editorial, *Multimedia Syst.* 12(3): 165-167 (2006) (with Rita Cucchiara)

"Simultaneous tracking of multiple body parts of interacting persons", *Computer Vision and Image Understanding*, vol.102, pp.1-21, 2006 (with S. Park).

“Supervised parametric and non-parametric classification of chromosome images”, Pattern Recognition 38(8): 1209-1223 (2005) (with M. P. Sampat, Alan C. Bovik, Kenneth R. Castleman).

"A Hierarchical Bayesian Network for Event Recognition of Human Actions and Interactions," Association For Computing Machinery Multimedia Systems Journal, vol. 10 no.2 pp164-179 2004 (with S. Park).

"Temporal Spatio-velocity Transform and Its Application to Tracking and Interaction," Computer Vision and Image Understanding, Vol.96, No.2, pp.100-128, 2004, (with K. Sato).

"Tracking Human Motion in a Structured Environment Using a Distributed Camera System," IEEE Trans. Pattern Analysis and Machine Intelligence, Vol. 21, No. 11, pp. 1241-1247, 1999 (with Qin Cai).

"Moving Obstacle Detection from a Navigating Robot," IEEE Trans. Robotics & Automation, Vol. 14, No. 3, pp. 404-416, 1998 (with D. Nair).

"Mobile Robot Navigation and scene modeling using stereo fish eye lens system," Machine Vision and Applications, Vol. 10, pp. 159-173, 1997 (with S. Shah).

"Physics-Based Integration of Multiple Sensing Modalities for Scene Interpretation," Proceedings of the IEEE, Vol. 85, No. 1, pp. 147-163, 1997 (with N. Nandhakumar).

"Mobile Robot Self-Location Using Model-Image Feature Correspondence," IEEE Transactions on Robotics and Automation, Vol. 12, No. 1, pp. 63-77, 1996 (with R. Talluri).

"Robot Self-Location Using Visual Reasoning Relative to a Single Target Object," Pattern Recognition, Vol. 28, No. 2, pp. 125-134, 1995 (with M. Magee).

"Significant Line Segments for an Indoor Mobile Robot," IEEE Trans. on Robotics and Automation, Vol. 9, No. 6, pp. 801-815, 1993 (with X. Lebeque).

"The Integration of Image Segmentation Maps Using Region and Edge Information," IEEE Trans. on Pattern Analysis and Machine Intelligence, Vol. 15, No. 12, pp. 1241-1252, 1993 (with Chen-Chau Chu).

"Position Estimation for an Autonomous Mobile Robot in an Outdoor Environment," IEEE Trans. on Robotics and Automation, Vol. 8, No. 5, pp. 573-584, 1992 (with R. Talluri).

"Applying Perceptual Organization to the Detection of Man--made Objects in Non-Urban Scenes," Pattern Recognition, Vol. 25, No. 8, pp. 835-853, 1992 (with Hong-Qian Lu).

"The Interpretation of Laser Radar Images by a Knowledge-Based System," *Machine Vision and Applications*, Vol. 4, pp. 145-163, 1991 (with Chen-Chau Chu).

"Matching Aerial Images to 3-D Terrain Maps," *IEEE Trans. on Pattern Analysis and Machine Intelligence*, Vol. 12, No. 12, pp. 1138-1149, 1990 (with J. J. Rodriguez).

"Integrated Analysis of Thermal and Visual Image for Scene Interpretation," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Vol. 10, No. 4, pp. 469-481, 1988 (with N. Nandhakumar).

"Analyzing Orthographic Projection of Multiple Velocity Vector Fields in Optical Flow," *Computer Vision, Graphics, and Image Processing*, Vol. 43, pp.157-191, 1988 (with H. Tsukune).

"Representation and Recognition of Objects From Dense Range Maps," *IEEE Transactions on Circuits and Systems*, Vol. 34, No. 11, pp.1351-1363, 1987 (with B. C. Vemuri).

Determining Object Motion in a Sequence of Stereo Images," *IEEE Journal of Robotics and Automation*, Vol. 3, No. 6, pp. 599-614, 1987 (with Y. C. Kim).

"Robot Guidance Using Computer Vision," *Pattern Recognition*, Vol. 17, No. 6, pp. 585-592, 1984 (with J. Courtney and M. Magee).

"Volumetric Descriptions of Objects from Multiple Views," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Vol. PAMI-5, No. 2, pp. 150-158,1983 (with W.N. Martin).

"Structure from Motion of Rigid and Jointed Objects," *Artificial Intelligence*, Vol. 19, pp. 107-130, 1982 (with J.A. Webb).

"Correspondence Processes in Dynamic Scene Analysis," *Proceedings of the IEEE*, Vol. 69, No. 5, pp. 562-572, 1981 (with L.S. Davis and W.N. Martin).

"Determining the Movement of Objects from a Sequence of Images," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Vol. PAMI-2, No. 6, pp. 554-562, 1980 (with J.W. Roach).

"Computer Detection and Classification of Three Citrus Infestations," *Computer Graphics and Image Processing*, 14, pp. 373-390, 1980 (with D.H. Williams).

"On Linear Shift Variant Digital Filters," *IEEE Transactions on Circuits and Systems*, Vol. CAS-27, No. 8, pp. 672-679, 1980 (with N.C. Huang).

"Computer Recognition of Partial Views of Curved Objects," *IEEE Transactions on Computers*, Vol. C-26, No. 8, pp. 790-800, 1977 (with J. McKee).

"Computer Analysis of Moving Polygonal Images," IEEE Transactions on Computers, Vol. C-24, No. 10, pp. 966-976, 1975 (with R.O. Duda).

"Finding the Edges of the Surfaces of Three-Dimensional Curved Objects by Computer," Pattern Recognition, Vol. 7, pp. 25-52, 1975 (with J.W. McKee).

"Picture Processing Using One-Dimensional Implementations of Discrete Planar Filters," IEEE Transactions on Acoustics, Speech, Signal Processing, Vol. ASSP-22, No. 3, pp. 164-173, 1974 (with M.T. Manry).

"Optimal Control of Time Delay Systems," IEEE Transactions on Automatic Control, Vol. AC-14, No. 6, pp. 678-687, 1969 (with D.H. Eller and H.T. Banks).

Conference Papers (selected):

"Spatio-Temporal Depth Cuboid Similarity Feature for Activity Recognition Using Depth Camera. 24th IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Portland, Oregon, June 2013, (with Lu Xia)

"A Scalable Metric Learning-Based Voting Method for Expression Recognition", 10th International Conference on Automatic Face and Gesture Recognition (FG2013), Shanghai, China, April 2013, (with Shaohua Wan)

"Nonparametric Facial Feature Localization", IEEE Workshop on Analysis and Modeling of Faces and Gestures (AMFG) in conjunction with 24th IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Portland, Oregon, June 2013, (with Birgi Tamersoy and Changbo Hu)

"Facial Expression Recognition with Temporal Modeling of Shapes", 1st IEEE Workshop on Dynamic Shape Capture and Analysis ICCV 2011, Barcelona, Spain, November 2011 (with Suyog Jain and Changbo Hu)

"Full-Motion Recovery from Multiple Video Cameras Applied to Face Tracking and Recognition", The Eleventh IEEE International Workshop on Visual Surveillance (VS2011- ICCV 2011), Barcelona, Spain, November 2011 (with Josh Harguess and Changbo Hu)

"Eigenshape based mean shift tracker", 3rd International Workshop on Machine Learning for Vision-based Motion Analysis (MLvMA-2011 IEEE ICCV 2011, Barcelona, Spain, November 2011 (with Chunmei Liu and Changbo Hu)

Hyun Joon Jung and J. K. Aggarwal, "A Binary Stock Event Model for Stock Trends Forecasting" 11th International Conference On Intelligent Systems Design and Applications (ISDA), November 2011, Cordoba, Spain.

"View Invariant Human Action Recognition Using Histograms of 3D Joints", The 2nd International Workshop on Human Activity Understanding from 3D Data (HAU3D - CVPR), Providence, RI, June 2012 (with L. Xia and C.-C. Chen)

"Improving Communication Skills of Children with ASDs through Interaction with Virtual Characters", International Conference on Serious Games and Application for Health, Braga, Portugal, November 2011.(Bretagne Abirached, Tiago Fernandes, Jose Carlos Miranda, Veronica Orvalho, Birgi Tamersoy and Yan Zhang)

"Modeling Human Activities as Speech", IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), Colorado Springs, CO, June 2011. With C. C. Chen)

"Recognizing Human-Vehicle Interactions from Aerial Video without Training", Workshop of Aerial Video Processing in conjunction with CVPR (WAVP), Colorado Springs, CO, June 2011. (with J. T. Lee, C.-C. Chen)

"A Large-scale Benchmark Dataset for Event Recognition in Surveillance Video", IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), Colorado Springs, CO, June 2011. (with S. Oh, A. Hoogs, A. Perera, N. Cuntoor, C.-C. Chen, J. T. Lee, S. Mukherjee, H. Lee, L. Davis, E. Swears, X. Wang, Q. Ji, K. Reddy, M. Shah, C. Vondrick, H. Pirsiavash, D. Ramanan, J. Yuen, A. Torralba, B. Song, A. Roy-Chowdhury, and M. Desai).

"Human Detection Using Depth Information by Kinect", International Workshop on Human Activity Understanding from 3D Data in conjunction with CVPR (HAU3D), Colorado Springs, CO, June 2011. (with L. Xia, C.-C. Chen).

Josh Harguess and J. K. Aggarwal, "Is There a Connection Between Face Symmetry and Face Recognition?", IEEE Computer Society and IEEE Biometrics Council Workshop on Biometrics in conjunction with IEEE CVPR 2011, Colorado Springs, CO, June 2011.

Josh Harguess, Changbo Hu and J. K. Aggarwal, "Occlusion Robust Multi-Camera Face Tracking", The 3rd International Workshop on Machine Learning for Vision-based Motion Analysis (MLvMA-2011) in conjunction with IEEE CVPR 2011, Colorado Springs, CO, June 2011.

"Exploiting Geometric Restrictions in a PTZ Camera for Finding Point-Correspondences Between Configurations", IEEE International Conference on Advanced Video and Signal Based Surveillance (AVSS), Boston MA, September 2010. (with Birgi Tamersoy)

"Improving Communication Skills of Children with Autism Spectrum Disorders (ASDs) through Interaction with Virtual Characters", Innovation in Health Care Delivery Systems

Symposium, Austin, TX, April 2011. (with Bretagne Abirached, Teresa Costa, Tiago Fernandes, VeronicaOrvalho, Birgi Tamersoy and Yan Zhang).

"Exploiting Geometric Restrictions in a PTZ Camera for Finding Point-correspondences Between Configurations", IEEE International Conference on Advanced Video and Signal based Surveillance (AVSS), Boston, USA, September 2010, (With Birgi Tamersoy).

"Counting Vehicles in Highway Surveillance Videos", 20th International Conference on Pattern Recognition (ICPR), Istanbul, Turkey, August 2010, (with Birgi Tamersoy).

"Human Shadow Removal with Unknown Light Source", International Conference on Pattern Recognition (ICPR), Istanbul, Turkey, August 2010 , (with C.-C. Chen).

"An Overview of Contest on Semantic Description of Human Activities (SDHA) 2010", International Conference on Pattern Recognition (ICPR) Contests, August 2010. (with M. S. Ryoo, C.-C. Chen, and A. Roy-Chowdhury). Website Link

"Video Scene Analysis of Interactions between Humans and Vehicles Using Event Context", ACM International Conference on Image and Video Retrieval (CIVR), Xian, China, July 2010 (with M. S. Ryoo, J. T. Lee) , (invited).

"View Independent Recognition of Human-vehicle Interactions using 3-D Models", IEEE Workshop on Motion and Video Computing (WMVC), Utah, USA, December 2009. (with J. T. Lee, M. S. Ryoo)

"Recognizing Human Action from a Far Field of View", IEEE Workshop on Motion and Video Computing (WMVC), Utah, USA, December 2009, (with C.-C. Chen)

"Fusing Face Recognition from Multiple Cameras", IEEE Workshop on Applications of Computer Vision (WACV), Utah, USA, December 2009, (with Josh Harguess, Changbo Hu).

"Patch-based Face Recognition from Video", IEEE International Conference on Image Processing (ICIP), Cairo, Egypt, November 2009 (with Changbo Hu, Josh Harguess)

"Spatio-Temporal Relationship Match: Video Structure Comparison for Recognition of Complex Human Activities", IEEE International Conference on Computer Vision (ICCV), Kyoto, Japan, October 2009,(with M. S. Ryoo and J. K Aggarwal)

"Observe-and-Explain: A New Approach for Multiple Hypotheses Tracking of Humans and Objects", At the IEEE Computer Society International Conference on Computer Vision and Pattern Recognition, Anchorage, Alaska, June 2008 (with M. Ryoo)

"Tracking and Segmentation of Highway Vehicles in Cluttered and Crowded Scenes", 2008 IEEE International Workshop on the Applications of Computer Vision, Copper Mountain, CO, January 2008 (with G. Jun)

"Recognition of High-level Group Activities Based on Activities of Individual Members", At the 2008 IEEE International Workshop on Motion and Video Computation, Copper Mountain, CO, January 2008 (with M. S. Ryoo)

"Real-time Detection of Illegally Parked Vehicles using 1-D Transformation", At the 2007 IEEE International Conference on Advanced Video and Signal based Surveillance, London U.K., September 2007 (with Jong Taek Lee, Michael Ryoo, and Matthew Riley)

"Detection of Abandoned Objects in Crowded Environments", At the 2007 IEEE International Conference on Advanced Video and Signal based Surveillance, London, U.K., September 2007 (with Medha Bhargava, Chia-Chih Chen, and Michael Ryoo)

"3D Face Recognition Founded on the Structural Diversity of Human Faces", at the IEEE International Conference on Computer Vision and Pattern Recognition, Minneapolis MN June 18-23, 2007, June 2007 (with Shalini Gupta, Mia K. Markey, and Alan C. Bovik).

"Hierarchical Recognition of Human Activities Interacting with Objects", IEEE Computer Society conference on Computer Vision and Pattern Recognition, 2nd International Workshop on Semantic Learning Applications in Multimedia (SLAM), Minneapolis, MN , June 2007 (with M. Ryoo).

"Detection of Fence Climbing by Stable Contact", at the 4th ACM International Workshop on Video Surveillance and Sensor Networks, October 27, 2006 Santa Barbara CA, October 2006 (with Elden Yu).

"Semantic Understanding of Continued and Recursive Human Activities", Proceedings of The 18th International Conference on Pattern Recognition, Hong Kong, August 2006 (with M. Ryoo).

"Detection of Fence Climbing from Monocular Video", Proceedings of The 18th International Conference on Pattern Recognition, Hong Kong, August 2006 (with Elden Yu).

"Recognition of Composite Human Activities through Context-Free Grammar based Representation", Proceedings of the IEEE Computer Society International Conference on Computer Vision and Pattern Recognition, New York, N.Y., June 2006 (with M. Ryoo).Add new

"Tracking Objects in Occluding Environments using Temporal Spatio-Velocity Transform", Proceedings of the 2nd Joint IEEE International Workshop on Visual Surveillance and Performance Evaluation of Tracking and Surveillance (VS-PETS), Beijing, China, October 2005 (with Koichi Sato).

Recognition of Two-person Interactions Using a Hierarchical Bayesian Network", First ACM SIGMM International Workshop on Video Surveillance, Berkeley CA, pp. 65-76, 2003 (with S. Park)

“Segmentation and Recognition of Continuous Human Activity”, Proceedings of ICCV Workshop on Detection and Recognition of Events in Video, Vancouver, Canada, pp. 29-35, 2001, (with A. Ali)

“Applying perceptual grouping to Content-based image retrieval: Building images, IEEE Computer Society Conference on Computer Vision and Pattern Recognition, Fort Collins Colorado, pp. 42-48, 1999 (with Q. Iqbal)

“Bayesian Paradigm for Recognition of Objects – Innovative Applications,” Proceedings of 3rd Asian Conference on Computer Vision Hong Kong, pp.vol.2, 275-282, 1998 (with S. Shah)

“Estimation of Position and Orientation from image sequence of a circle,” Proceedings IEEE Conference on Robotics and Automation, Albuquerque, NM, pp. 2252-2257, 1997 (with M. Sato)

“Tracking Human Motion Using Multiple Cameras,” Proceedings of the 13th International Conference on Pattern Recognition, Vienna, Austria, pp.C:68-72, 1996 (with Q. Cai)

“Depth Estimation Using Stereo Fish-eye Lenses,” Proceedings IEEE International Conference on Image Processing, Austin, TX, pp.II-740- II-744. (with S. Shah)

“Surface Correspondence and Motion Computation from a Sequence of Range Images”, Proceedings of IEEE International Conference on Robotics and Automation, San Diego CA, pp.1052-1059, 1994 (with B. Sabata)

“Analysis of the Stereo Correspondence Process in Scenes with Occluding Objects,” Proceedings of the 11th International Conference on Pattern Recognition, The Hague The Netherlands Vol. I pp.470-473, 1992 (with U. Dhond)

“Extraction and Interpretation of Semantically Significant Line Segments for a Mobile Robot,” Proceedings of the IEEE Conference on Robotics and Automation, Paris, France, pp.1778-1785, 1992 (with X. Lebeque)

“Multi-Sensor Image Interpretation Using Laser Radar and Thermal Images”, Proceedings of 7th IEEE Conference on Artificial Intelligence Applications, Miami, FL pp.190-196, 1991 (with C.C. Chu)

Review Papers

"Human Activity Analysis: A Review", ACM Computing Surveys (CSUR), 43(3), April 2011 (with M.S. Ryoo).

"Human Motion Analysis: A Review," Computer Vision and Image Understanding, Vol. 73, No. 3, pp. 428-440, 1999 (with Q. Cai).

"Non-rigid Motion Analysis: Articulated and Elastic Motion," Computer Vision and Image Understanding, Vol. 70, No. 2, pp. 142-156, 1998 (with Q. Cai, W. Liao and B. Sabata).

"Model-Based Object Recognition in Dense-Range Images--A Review," ACM Computing Surveys, Vol. 25, No. 1, 1993 (with F. Arman).

"Sensors and Sensor Fusion," Encyclopedia of Artificial Intelligence, 2nd Edition, Edited by S. C. Shapiro, John Wiley and Sons, Inc., pp. 1511-1526, 1992 (with Y. F. Wang).

"Estimation of Motion from a Pair of Range Images: A Review," Computer Vision, Graphics, and Image Processing, Vol. 54, No. 3, pp. 309-324, 1991 (with B. Sabata).

"Structure from Stereo -- A Review," IEEE Trans. on Systems, Man, and Cybernetics, Vol. 19, No. 6, pp. 1489-1510, 1989 (with U.R. Dhond).

"Recent Progress in Object Recognition from Range Data," Image and Vision Computing, Vol. 7, No. 4, pp. 395-407, 1989 (with J.P. Brady and N. Nandhakumar).

"On the Computation of Motion from Sequences of Images--A Review," Proceedings of the IEEE, Vol. 76, No. 8, pp. 917-935, 1988 (with N. Nandhakumar).

"Dynamic Scene Analysis: A Survey," Computer Graphics and Image Processing, vol. 7, no. 3, pp. 356-374, 1978 (with W.N. Martin).

Book Chapters

"An Overview of Contest on Semantic Description of Human Activities (SDHA) 2010", International Conference on Pattern Recognition (ICPR) Contests, August 2010. Springer LNCS 6388, Edited by Devrim Unay, Zehra Cataltepe and Selim Aksoy, (with M. S. Ryoo, C.-C. Chen, and A. Roy-Chowdhury,

“ Motion Analysis: Past, Present and Future”, Distributed Video Sensor Networks Edited by Bir Bhanu, Chinya V. Ravishankar, Amit K. Roy-Chowdhury, Hamid Aghajan, and Demetri Terzopoulos, Springer- Verlag 2011.

“Foreword to: Pattern Recognition and Machine Vision, In Honor and Memory of Professor King-Sun Fu, Editor Patrick Shen-Pei Wang, River Publishers, Aalborg, Denmark, March 2010.

"The Average-Half-Face in 2D and 3D Face Recognition", Pattern Recognition and Machine Vision: In Honor and Memory of Professor King-Sun Fu, River Publishers, Aalborg, Denmark, Ch. 9, pp. 135-148, 2010 (with Josh Harguess).

"Local and Global Stereo Methods," in The Handbook on Image and Video Processing, Alan Bovik , Editor, pp. 297-308, 2005. (with Yang Liu).

"3D Shape Reconstruction from Multiple Views," in Handbook of Image and Video Processing, Editor, Alan C. Bovik, Academic Press, pp. 243-257, 2000 (with H. Zhao, Chhandomay Mandal, and Baba C. Vemuri.)

"Object Recognition and Performance Bounds," Lecture Notes in Computer Science: Image Analysis and Processing, pp. 343-360, Edited by Alberto Del Bimbo, Springer Verlag, 1997.

"Pattern Category Assignment by Neural Networks and Nearest Neighbors Rule: A Synopsis and a Characterization," in Studies in Pattern Recognition (A Memorial to the Late Professor King-Sun Fu), Editor, H. Freeman, World Scientific Publishing Company, Singapore, 1996 (with A. Mitiche).

"A Comparative Study of Three Paradigms for Object Recognition -- Bayesian Statistics, Neural Net-works, and Expert Systems," Advances in Image Understanding (a Festschrift for Aziel Rosenfeld), Editors K. Bowyer and N. Ahuja, IEEE Computer Society Press, pp. 241-262, 1996(with J. Ghosh, D. Nair and I. Taha).

"Software for Parallel Computing -- A Perspective," in Parallel Computing: Paradigms and Applications, Editor Albert Y. Zomaya, International Thomson Computer Press, pp. 357-375, 1996 (with Pratap Chillakanti).

"Analysis of Left Ventricle Motion," in Recent Developments in Computer Vision, Springer-Verlag, Editors S. Z. Li, D. P. Mital, E. K. Teoh and H. Wang, pp. 43-58, 1996 (with Wen-Hung Liao and S. J. Aggarwal).

"Modeling Structured Environments Using Robot Vision," in Recent Developments in Computer Vision, Editors S. Z. Li, D. P. Mital, E. K. Teoh and H. Wang, Springer-Verlag, pp. 113-128, 1996 (with Shishir Shah).

"Integrated Analysis of Thermal and Visual Images for Scene Interpretation," in Multisensor Integration and Fusion for Intelligent Machines and Systems, Editors Ren C. Luo and Michael G. Kay, Ablex Publishing Corp., NJ, pp. 375-406, 1995 (with N. Nandhakumar).

"Parallel Processing Methodologies for Image Processing and Computer Vision, in Advances in Electronics and Electron Physics, Vol. 87, Editor Peter W. Hawkes, Academic Press, pp. 259-300, 1994 (with S. Yalamanchili).

"On Supporting Rule-Based Image Interpretation Using a Distributed Memory Multicomputer," in *Parallel Processing for Artificial Intelligence*, Editors, L. Kanal, et al., Elsevier Science Publishers, B.V., pp. 21-44, 1994 (with C. C. Chu and J. Ghosh).

"Hypergraph Based Feature Matching in a Sequence of Range Images," in *Time Varying Image Processing and Moving Object Recognition*, 3, Editor, V. Cappellini, Elsevier, pp. 45-56, 1994 (with B. Sabata).

"Fusion of Color and Geometric Information," in *Multisensor Fusion for Computer Vision*, J. K. Aggarwal, Editor, Springer Verlag, Berlin, pp. 213-237, 1993 (with X. Lebegue and D. C. Baker).

"The Issues, Analysis and Interpretation of Multisensor Images," in *Multisensor Fusion for Computer Vision*, J. K. Aggarwal, Editor, Springer Verlag, Berlin, pp. 37-62, 1993 (with C.C. Chu).

"Position Estimation Techniques for an Autonomous Mobile Robot - A Review," in *The Handbook of Pattern Recognition and Computer Vision*, C. H. Chen, L. F. Pau, and P. S. P. Wang, Editors, World Scientific Publishing Co., Inc., Singapore, pp. 769-801, 1993 (with R. Talluri).

"CAD-Based Object Recognition in Range Images Using Pre-compiled Strategy Trees," in *Three-Dimensional Object Recognition Systems*, A. K. Jain and P. J. Flynn, Editors, Elsevier Science Publishers, Amsterdam pp. 115-134, 1993 (with F. Arman).

"Multisensory Computer Vision," *Advances in Computers*, Volume 34, Edited by M. C. Yovits, Academic Press, Inc. pp. 59-111, 1992 (with N. Nandhakumar).

"Sensors and Sensor Fusion," *Encyclopedia of Artificial Intelligence*, 2nd Edition, Edited by S. C. Shapiro, John Wiley and Sons, Inc., pp. 1511-1526, 1992 (with Y. F. Wang).

"VisTA--An Image Understanding Architecture," *Parallel Architectures and Algorithms for Image Understanding*, V. K. Prasanna Kumar, Ed., Academic Press, Inc., pp. 121-154, 1991 (with M. H. Sunwoo).

"Sensor Data Fusion in Robotic Systems," *Control and Dynamic Systems: Advances in Theory and Applications*, Volume 39: *Advances in Robotic Systems*, Part 1 of 2, Edited by C. T. Leondes, Academic Press, Inc., pp. 435-462, 1991 (with Y. F. Wang).

"Segmentation and Analysis of Multi-Sensor Images," *Machine Vision for Three-Dimensional Scenes*, Edited by Herbert Freeman, Academic Press, Inc., pp. 267-300, 1990.

"A Phenomenological Approach to Thermal and Visual Sensor Fusion," Highly Redundant Sensing in Robotic Systems (NATO ASI Series F: Computer and Systems Sciences, Vol. 58), Edited by Julius T. Tou and Jens G. Balchen, Springer Verlag, pp. 87-101, 1990 (with N. Nandhakumar).

"Parallelism in Computer Vision: A Review," Parallel Algorithms for Machine Intelligence and Vision, Edited by Vipin Kumar, P.S. Gopalakrishnan, and Laveen N. Kanal, Springer-Verlag, pp. 271-309, 1990 (with Vipin Chaudhary).

"Multisensor Fusion for Automatic Scene Interpretation," Analysis and Interpretation of Range Images, Edited by R.C. Jain and A.K. Jain, Springer-Verlag, pp. 339-361, 1990 (with N. Nandhakumar).

"Parallelism in Low-Level Computer Vision -- A Review," Data Analysis In Astronomy III, Edited by V. Di Gesu, L. Scarsi, P. Crane, J.H. Friedman, S. Leviardi, and M.C. Macarone, Plenum Press, pp. 255-269, 1989 (with V. Chaudhary).

"3-D Structure from 2-D Images," Advances in Machine Vision, Edited by Jorge L. C. Sanz, Springer-Verlag, pp. 64-121, 1989 (with C.H. Chien).

"Inference of Object Surface Structure From Structured Lighting - An Overview," Machine Vision, Algorithm, Architectures and Systems, Edited by H. Freeman, Academic Press, Inc. pp. 193-220, 1988 (with Y.F. Wang).

"On the Computation of Motion from a Sequence of Monocular or Stereo Images - An Overview," Machine Intelligence and Knowledge Engineering for Robotic Applications, Edited by Andrew K.C. Wong and Alan Pugh, Springer-Verlag, pp. 83-104, 1987.

"Control, Time-Varying Systems and Signal Processing," The Encyclopedia of Physical Science and Technology, Vol. 3, Academic Press, pp. 656-667, 1987 (with N.C. Huang and T.Y. Leou).

"Structure and Motion Computation from Point or Line Correspondences in Images," Advances in Image Processing and Pattern Recognition, Edited by V. Cappellini and R. Marconi, North Holland, pp. 171-178, 1986 (with Y.F. Wang).

"Exploitation of Image Parallelism via the Hypercube," Hypercube Multiprocessors 1987, Edited by M. T. Heath, SIAM, Philadelphia, pp. 426-437, 1987 (with S. -Y. Lee).

"3-D Object Representation from Range Data Using Intrinsic Surface Properties," Edited by T. Kanade, Three-Dimensional Machine Vision, Kluwer Academic Publishers, pp. 241-266, 1986 (with B. Vemuri and A. Mitiche).

"A Computational Analysis of Time-Varying Images," Handbook of Pattern Recognition and Image Processing, Editors T.Y. Young and K.S. Fu, Academic Press, pp. 311-332, 1986 (with A. Mitiche).

"Image Processing Architectures: A Taxonomy and Survey," Progress in Pattern Recognition, Vol II, Edited by L. Kanal and A. Rosenfeld, Published by North-Holland, pp. 1-37, 1985 (with K. Palem, S. Yalamanchili, L.S. Davis, and A.J. Welch).

"Three-Dimensional Description of Objects and Dynamic Scene Analysis," Digital Image Analysis, Edited by S. Levialdi, Pitman Books Ltd., pp. 29-46, 1984.

"Dynamic Scene Analysis," Image Sequence Processing and Dynamic Scene Analysis, Edited by T. S. Huang, Springer-Verlag, pp. 40-73, 1983 (with W.N. Martin).

"Analyzing Dynamic Scenes Containing Multiple Moving Objects," Image Sequence Analysis, Edited by T. S. Huang, Springer-Verlag, pp. 355-380, 1981 (with W.N. Martin).

"Occlusion in Dynamic Scene Analysis," Digital Image Processing, edited by J. C. Simon and R. M. Haralick, D. Reidel Publishing Company, pp. 579-590, 1981 (with W. N. Martin).

"Survey: Representation Methods for Three-Dimensional Objects," Progress in Pattern Recognition, Vol. 1, edited by L. N. Kanal and A. Rosenfeld, North-Holland Publishing Company, pp. 377-391, 1981 (with L. S. Davis, W. N. Martin and J. W. Roach).

"A Note on the Stability of an Nth Order Nonlinear System," Recent Advances in Engineering Science, Vol. II, Gordon Breach, London, pp. 267-278, 1968 (with E. K. Jackson).

Papers Reprinted in Books

"Structure from Stereo -- A Review," (with U.R. Dhond), IEEE Trans. on Systems, Man, and Cybernetics, Vol. 19, No. 6, pp. 1489-1510, 1989, reprinted in the book Autonomous Mobile Robots, Edited by S. S. Iyengar and A. Elfes, IEEE Computer Society Press, 1992.

"Volumetric Descriptions of Objects from Multiple Views," (with W.N. Martin), IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. PAMI-5, no. 2, pp. 150-158, March 1983, reprinted in Computer Vision: Principles, Edited by R. Kasturi and R. Jain, IEEE Computer Society Press, pp. 358-366, 1991.

"Determining the Movement of Objects from a Sequence of Images," (with J. W. Roach), IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. PAMI-2, no. 6, pp. 554-562, 1980, reprinted in the book, Digital Image Processing and Analysis, vol. 2, Edited by R. Chellappa and A. A. Sawchuck, IEEE Computer Society Press, 1986.

"Computer Analysis of Moving Polygonal Images," (with R. O. Duda), IEEE Trans. on Computers, vol. C-24, no. 10, pp. 966-976, 1975, reprinted in the book, Digital Image Processing and Analysis, Edited by R. Chellappa and A. A. Sawchuck, IEEE Computer Society Press, 1986.

"Error Analysis of Two-Dimensional Recursive Digital Filters Employing Floating-Point Arithmetic," (with M. D. Ni), IEEE Trans. Computers, vol. C-25, no. 7, pp. 755-759, 1976, reprinted in the book, Two-Dimensional Digital Signal Processing, Edited by S. K. Mitra and M. P. Ekstrom in the series, Benchmark Papers in Electrical Engineering and Computer Science, Dowden, Hutchinson, and Ross, Inc., 1978.

"An Error Analysis for a Vector Model of Two-Dimensional Recursive Filters," (with K. O. Shipp, Jr.), IEEE Transactions Acoustics, Speech, Signal Processing, vol. ASSP-24, no. 4, pp. 339-341 1976, reprinted in the book, Two-Dimensional Digital Signal Processing, Edited by S. K. Mitra and M. P. Ekstrom in the series, Benchmark Papers in Electrical Engineering and Computer Science, Dowden, Hutchinson, and Ross, Inc., 1978.

"Picture Processing Using One-Dimensional Implementations of Discrete Planar Filter," (with M. T. Manry), IEEE Transactions Acoustics, Speech, Signal Process., vol. ASSP-22, no. 3, pp. 165-173, 1974, reprinted in the book, Two-Dimensional Digital Signal Processing, Edited by S. K. Mitra and M. P. Ekstrom in the series, Benchmark Papers in Electrical Engineering and Computer Science, Dowden, Hutchinson, and Ross, Inc., 1978.

"Computer Analysis of Moving Polygonal Images," (with R.O. Duda), IEEE Transactions on Computers, vol. C-24, no. 10, pp. 966-976, 1975, reprinted in the book, Computer Methods in Image Analysis, Edited by J. K. Aggarwal, R.O. Duda and A. Rosenfeld, IEEE Press, 1977.

"On Equivalent Systems in Optimal Control and Stability Theory," (with N. H. McClamroch), IEEE Trans. On Automatic Control, vol. AC-12, no. 3, pp. 333, 1967, reprinted in the book, Nonlinear Systems: Stability Analysis, Edited by J. K. Aggarwal and M. Vidyasagar, in the series, Benchmark Papers in Electrical Engineering and Computer Science, Dowden, Hutchinson, and Ross, Inc., 1977.

"Some Observations Concerning the Boundedness of Solutions of Coupled Lienard's Equations," (with R. A. Skoog), IEEE Trans. Circuit Theory, vol. CT-19, no. 6, pp. 625-626, 1972, reprinted in the book, Nonlinear Systems: Stability Analysis, Edited by J. K. Aggarwal and M. Vidyasagar, in the series, Benchmark Papers in Electrical Engineering and Computer Science, Dowden, Hutchinson, and Ross, Inc., 1977.

"Singular Points of Planar Ordinary Differential Systems," J. Diff. Equations, vol. 3, no. 2, pp. 203-213, 1967, reprinted in the book Nonlinear Systems: Stability Analysis, Edited by J. K. Aggarwal and M. Vidyasagar, in the series Benchmark Papers in Electrical Engineering and Computer Science, Dowden, Hutchinson, and Ross, Inc., 1977.

"Randomly Sampled Digital Filters," (with E. P. F. Kan), IEEE Trans. Audio Electroacoustics, vol. AU-20, no. 1, pp. 52-57, 1972, reprinted in the book, Selected Papers in Digital Signal Processing, II, Edited by the Digital Signal Processing Committee, IEEE Acoustics, Speech and Signal Processing Society, A. V. Oppenheim, Chairman, IEEE Press, 1975.

"On Equivalent Systems in Optimal Control and Stability Theory," (with N. H. McClamroch), IEEE Trans. Auto. Control, vol. AC-12, no. 3, pp. 333, 1967, reprinted in the book, System Sensitivity Analysis, Edited by J. B. Cruz, Jr. in the series Benchmark Papers in Electrical Engineering and Computer Science, Dowden, Hutchinson, and Ross, Inc., 1973.

Invited (selected) Talks:

"Computer Recognition of Human Activities, Objects and their Interactions", Ibpria 2013, Madeira, Portugal June 5, 2013

"Computer Vision based Strategies for Improving Communication Skills of Children with Autism Spectrum Disorders", The University of Porto, Porto, Portugal June 14, 2013.

"An Interactive Game for Teaching Facial Expressions to Children with Autism Spectrum Disorders", 5th International Symposium on Communications, Control, and Signal Processing, May2-4, 2012, Rome Italy. (with Suyog Jain, Birgi Tamersoy, Yan Zhang and Veronica Orvalho)

Tutorial: "Frontiers of Human Activity Analysis", Tutorials of IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), Colorado Springs, CO, June 2011. (with M. S. Ryoo, and K. Kitani)

Plenary Talk: "Recognition of Human Activities", at the 14th International Workshop, IWCIA 2011, Madrid Spain, May 2011.

Invited Talk: "Computer Recognition of Human Activities, Objects and their Interactions", at The University of Texas at Dallas, Erik Jonsson School of Engineering and Computer Science, Distinguished Lecture Series 2011, and Dallas Chapter of IEEE Signal Processing Society, April 15, 2011.

Invited Talk: "Recognition of Human Activities", Departamento de Ciencia de Computadores, at the University of Porto, Porto, Portugal, May 2011.

Invited Talk: "Recognition of Human Faces and Emotions" Departamento de Ciencia de Computadores, at the University of Porto, Portugal, May 2011.

“Video Scene Analysis of Interactions between Humans and Vehicles Using Event Context”, ACM International Conference on Image and Video Retrieval (CIVR), Xian, China, July 2010, (with M. S. Ryoo, J. T. Lee).

"Recognition of Human Activities" at the Electronic and Telecommunication Research Institute (ETRI), Daejeon, Korea, September 2009

“Smart Vision Systems for Environment Monitoring and Surveillance" at the 21C TransMedia Innovation Symposium - "Transdisciplinary Creativity", Seoul, Korea, September 2009.

Plenary Talk: "Computer Recognition of Human Activities and Objects", at the 2008 Second ACM/IEEE International Conference on Distributed Smart Cameras, Stanford University, Stanford, CA, September 2008

Keynote Talk: "Computer Vision and Recognition of Human Activities", at the 23rd International Symposium on Computer and Information Sciences, Istanbul, Turkey, October 2008

Keynote Talk: "Recognition of Human Activities", at 4th International Symposium on Visual Computing, Las Vegas, Nevada , December 2008

Invited Talk "Computer Vision: Past, Present and Future" at the National Chengchi University, Taipei, Taiwan, March 2008

Invited Talk "Recognition of Human Activities, Objects and their Interactions" at the National Tsing Hua University, Hsinchu, Taiwan, March 2008

Invited Talk "Recognition of Human Activities, Objects and their Interactions" at the National Chengchi University, Taipei, Taiwan, March 2008

Invited Talk “Recognition of Human Activities, Objects and their Interactions ” at the City University of Hong Kong, Kowloon, Hong Kong, March 2008

Distinguished Lecture “Recognition of Human Activities”, at the University of Buffalo, The State University of New York, Department of Computer Sciences and Engineering , April 2008

Plenary Talk “Computer Recognition of Human Activities, Objects and their Interactions” Keynote at the 12th International Workshop on Combinatorial Image Analysis, Buffalo, NY, April 2008

Invited Talk "Recognition of Human Activities" at the University of Maryland, Institute for Advanced Computer Studies, College Park, MD, April 2008

Invited Talk "Computer Recognition of Human Activities, Objects and their Interactions"
Graduate Seminar at the University of Victoria, British Columbia, Canada, June 2008

Invited Talk "Computer Vision and Recognition of Human Activities" at the Victoria
Section of IEEE, Victoria, British Columbia, Canada, June 2008

Invited Talk "Computer Recognition of Objects, Humans and Activities" at The Okawa
Prize Memorial Symposium at Waseda University, Japan, November 2007 Add new

Keynote Lecture: " Recognition of Human Activity and Object Interactions" at the
Second International Conference on Computer Vision Theory and Applications, March 9,
2007 , Barcelona Spain, March 2007

Distinguished Lecture 2007: " Human Activity Recognition" at the Department of
Information Engineering, University of Padova, March 13, 2007, Padova, Italy, March
2007

Keynote Address: " Human Activity Recognition", at the AICTE sponsored National
Seminar on Mobile & Network Security & Cryptographic Protocols, Amrita University,
March 23, 2007, Coimbotore, India, March 2007

Series of three Lectures: "Introduction to Pattern Recognition and Bayesian Statistics", at
Amrita University March 22-23, 2007, Coimbotore, India, March 2007

Invited Presentation: "Recognition of Human Activities" at the Department of Electrical
Engineering, Indian Institute of Technology, April 4, 2007, Delhi, India, April 2007

Distinguished Speaker Series 2006-2007 Lecture: "Recognition of Human Activity and
Object Interactions", at the Department of Electrical Engineering and Computer Science,
Northwestern University, April 27, 2007, Evanston IL , April 2007

Invited Presentation: "Using Structure, Color and Texture for Content-based Image
Retrieval" at the 2007 Workshop on Recent Trends in Signal Processing at the Technical
University of Cluj-Napoca, July 9-10, Cluj Napoca, Romania, July 2007

Plenary Talk: "Human Activity Recognition: A Grand Challenge" at the International
Symposium on Signals, Circuits and Systems, July 12-13, 2007, Iasi Romania, July 2007

Seminar: "Recognition of Human Activities - Recent Trends," at the College of
Computing, Georgia Institute of Technology, September 25, 2006 Atlanta, GA,
September 2006

Keynote: "Monitoring People and their Activities" at the IEEE International Symposium
on Multimedia (ISM2006) December 11-13, 2006, San Diego CA , December 2006

Keynote Speech: "Human Activity Recognition - A Grand Challenge", at the Digital Image Computing Techniques and Applications Conference, Cairns, Australia, December 2005

Plenary Evening Talk: "Human Activity Recognition - A Grand Challenge" at the First International Conference on Pattern Recognition and Machine Intelligence, Kolkata, India, December 2005

Keynote Lecture: "Human Activity Recognition - A Grand Challenge", at the Eight International Conference on Enterprise Information Systems, Paphos, Cyprus, May 2006

Seminar: " Human Activity Recognition", Department of Computer Engineering, Istanbul Technical University, Istanbul, Turkey, June 2006

Presentation: The contributions of Professor C. V. Ramamoorthy" at the Advances in Computer Science and Engineering Workshop Honoring and Celebrating the 80th Birthday of Professor C. V. Ramamoorthy, Berkeley CA , June 2006

Plenary Session -vii, "Human Activity Recognition", at the World Conference on Integrated Design & Process Technology, San Diego CA , June 2006

Seminar: "Human Activity Recognition", at the Shanghai Jiao Tong University, Minhang Campus, Institute of Image Processing and Pattern Recognition, Shanghai, China , August 2006

Seminar: "Human Activity Recognition - A Grand Challenge", at the National Laboratory for Pattern Recognition, Institute of Automation, Chinese Academy of Sciences, Beijing, China, August 2006

Seminar: "Human Activity Recognition - Recent Results", Tsinghua University, Beijing, China, August 2006

“Future Directions: Tracking Humans,” IEEE Computer Society Workshop on Motion and Video Computing, Orlando, FL, December 5, 2002.

“Human Motion: Actions and Interactions,” 1st Iberian Conference on Pattern Recognition and Image Analysis, Palma de Mallorca, Spain, June 4, 2003.

“Computer Modeling and Recognition of Human-Human Interaction,” 1st IEEE Workshop on Computer Vision and Pattern Recognition for Human-Computer Interaction, Madison, WI, June 17, 2003.

“Future Directions: Human Computer Interaction,” 1st IEEE Workshop on Computer Vision and Pattern Recognition for Human-Computer Interaction, Madison, WI, June 17, 2003.

"Mahalanobis: The Renaissance Professor, "Inaugural speech, 3rd International Conference on Advances in Pattern Recognition and Digital Techniques, December 28-31, 1993, Calcutta, India (P. C. Mahalanobis Birth Centenary Celebration).

"Computer Vision: A Perspective," The Robert T. Chien Distinguished Lecture Series, Coordinated Science Laboratory, University of Illinois, Urbana, March 1991.

"Computer Vision: Present and Future," Matsushita Research Institute, Tokyo, Japan, December 1990.

"Computer Vision Research at The University of Texas at Austin," Electrotechnical Laboratory, Tokyo, Japan, 1989.

"Parallelism in Computer Vision," University of California, Berkeley, and IBM Almaden Research Center, San Jose, California, May 1989.

"Computer Vision: Present and Future," University of California, Berkeley, September 1988.

"Computer Vision," the Indian Institute of Technology, Powai, India, January 1988.
"3-D Structure from 2-D Images," Image Processing Workshop, Chitou, Taiwan, June 29th, 1986.

"Three-Dimensional Descriptions of Objects and Dynamic Scene Analysis," Conference on Image Analysis and Processing, Brindisi, Italy, November 1982.

"Dynamic Scene Analysis, "NATO Advanced Study Institute on Image Sequence Processing and Dynamic Scene Analysis, Braunlage, West Germany, June 1982.

Editorial Boards

Editor, Computer Vision and Image Understanding, 1991-2013.

Associate Editor, Intl. Journal of Pattern Recognition and Artificial Intelligence, 1993-present.

Member, Editorial Board, Intl. Journal of Imaging Science and Technology, 1993-2000.

Member, Editorial Board, Journal of Mathematical Imaging and Vision, 1991-1999.

Member, Editorial Board, Image and Vision Computing, 1982-2005.

Associate Editor, Machine Vision and Applications, 1988-2004.

Editor, IEEE Transactions on Parallel and Distributed Systems, 1992-1996.

Guest Editor, Image and Vision Computing, Special Issue on Range Image Understanding, Vol. 3, No.10, 1992 (with B. C. Vemuri).

Associate Editor, Computer Vision, Graphics and Image Processing, 1984-1991

Associate Editor, Pattern Recognition Journal, 1980-1990.

Editor, IEEE EXPERT, 1986-1989.

Co-Guest Editor for first issue of the IEEE Computer Society IEEE Expert, February 1986.

Editor, Selected Reprint Series, IEEE Press, 1985-88.

Member, Editorial Board, IEEE Press, 1984-88.

Guest Editor, Special Issue on Motion and Time Varying Imagery, Computer Vision, Graphics and Image Processing, 1983.

Co-Editor, Special Issue on Motion of the IEEE Computer Society Transactions on Pattern Analysis and Machine Intelligence, 1980.

Co-Editor, Special Issue on Digital Filtering and Image Processing of the Circuits and Systems Society Transactions on Circuits and Systems, March 1975.

Associate Editor for Digital Signal Processing, Transactions of the Circuits and Systems Society, 1973-75.

Editor, Newsletter of the Circuits and Systems Society, 1971-72.

Conference Committees (Selected)

Advisory Committee, International Association for Pattern Recognition, October 2006-August 2010

Member of Program Committee: 6th IEEE International Conference on Advanced Video and Signal Based Surveillance (AVSS 09) Genoa, Italy, September 2008-August 2009

Member of Program Committee: 15th International Conference on Image Analysis and Processing (ICIAP 09) Vietri sul Mare , Salerno, Italy, September 2008-August 2009

Member of Program Committee: 5th International Symposium on Visual Computing (ISVC 09) Las Vegas, Nevada, September 2008-August 2009

Member of Program Committee: IEEE Workshop on the Applications of Computer Vision (WACV) 2009, Snowbird Utah, January 2009-August 2009

Member of Program Committee: IEEE Workshop on Motion and Video Computing (WMVC) 2009 - Snowbird, Utah, April 2009-August 2009 Add new

Committee, Workshop on Motion and Video Computation, Copper Mountain, CO 2008

Program Committee for IAPR - MVA 2009 Yokohama, Japan, May 20-22, 2009, , February 2008-June 2009

Program Committee for CVGI of 23rd International Symposium on Computer and Information Sciences, Istanbul, Turkey, Oct. 27-29, 2008 , March 2008-November 2008

Member of Steering Committee of International Conference on Multimedia and Expo 2008

1st ACM Int. Workshop on Vision Networks for Behaviour Analysis, Oct. 31, 2008 Vancouver, Canada, (Honorary), April 2008-November 2008 Add new

IEEE Workshop on the Applications of Computer Vision, February 2007

IEEE Workshop on Motion and Video Computing, February 2007

4th ACM Int. Work. on Video Surveillance and Sensor Networks, October 2006

International Conference on Advanced Video and Signal based Surveillance, Como, Italy, 2005.

ACM 2nd Workshop on Visual Surveillance and Sensor Networks, New York, NY, 2004.

17th International Conference on Pattern Recognition, Cambridge, UK, 2004.

First ACM International Workshop on Video Surveillance, Berkeley, CA, 2003.

1st Iberian Conference on pattern Recognition and Image Analysis, Palma de Mallorca, Spain, 2003.

IEEE Conference on Advanced Video and Signal based Surveillance, Miami, Florida, 2003.

IEEE Workshop on Multi-object Tracking, Madison, Wisconsin, 2003.

Co-General Chairman, Workshop on Motion and Video Computing, Orlando, Florida, 2002.

IAPR Workshop on Articulated Motion and Deformable Objects, Palma de Mallorca, Spain, 2002.

1st International Symposium on 3D Data Processing, Visualization and Transmission, Padova, Italy, 2002

Asian Conference on Computer Vision, Australia, 2002.

IEEE Workshop on Computer Vision Beyond the Visible Spectrum, Methods and Applications, 2001.

Co-chairman, IEEE Computer Society Workshop on Human Motion, Austin, TX, 2000.

First International Workshop on Articulated Motion and Deformable Objects, Palma de Mallorca, 2000.

4th Asian Conference on Computer Vision, Taipei, Taiwan 2000.

IEEE Workshop on Computer Vision Beyond the Visible Spectrum, Fort Collins Colorado, 1999.

Co-chairman, IEEE Computer Society Workshop on Motion of Nonrigid and Articulate Objects, Austin, TX, 1994.

Program Committee, IEEE Computer Society 2nd CAD-Based Vision Workshop, Pittsburgh, PA, 1994.

General Chairman, IEEE Computer Society Conference on Computer Vision and Pattern Recognition, New York, NY, 1993.

Conference Co-Chairman, SPIE Conference on Sensor Fusion and Aerospace Applications, Orlando, Florida, 1993.

Program Chairman, Computer Vision Conference, 10th International Conference on Pattern Recognition, Atlantic City, NJ, 1990.

IEEE Workshop on Interpretation of 3D Scenes, Austin, TX, 1989.

Director, NATO Advanced Research Workshop on Multisensor Fusion for Computer Vision, Grenoble, France, 1989.

IEEE Computer Society Conference on Computer Vision and Pattern Recognition, San Francisco, CA, 1985.

Program Chairman, First Conference on Artificial Intelligence Applications sponsored by IEEE Computer Society, Denver, CO, 1984.

Inter-Disciplinary ACM Workshop on Motion: Representation and Perception, Toronto, Canada, 1983

General Chairman, Computer Society Pattern Recognition and Image Processing Conference, Dallas, TX, 1981.

Program Chairman, Workshop on Computer Analysis of Time Varying Imagery, sponsored by IEEE Computer Society, Philadelphia, PA, 1979.

Chairman, Twelfth Midwest Symposium on Circuit Theory, Austin, TX, 1969.

Other Professional Activities

Member of IAPR K.-S. Fu Prize Committee, September 2007-August 2010

ACM Steering Committee for Workshop on Visual Surveillance and Sensor Networks, 2004-present.

International Association for Pattern Recognition Fellow Committee, 2002-2006.

IEEE Transactions on Networks Steering Committee, 2002-04.

Chairman, IEEE Transactions on Networks Steering Committee, 2003-04.

IEEE Computer Society Fellow Committee, 2001-03.

International Association for Pattern Recognition Education Committee, 2001-03.

IEEE Prize Papers/Scholarship Award Committee, 1999-02.

Chairman, IEEE Computer Society Transactions Operation Committee, Publications Board, 2001.

IEEE Computer Society Publications Board, 2000-02

IEEE Computer Society representative to the International Association for Pattern Recognition, 1985-2003.

IEEE Computer Society Fellow Committee 1997-98.

IEEE Transnational Relations Committee, 1984-87.

ADCOM of Circuits and Systems Society, 1972-1975.

Chairman, Signal Processing Technical Committee of IEEE Circuits and Systems Society, 1974-1976.

PhD Graduates of J.K. Aggarwal

1969...Donald Eller
1969...Halbert Bybee
1969...Ron Rhoten
1971...Robert O'Donnell
1975...James William McKee
1975...Ming-Duenn Ni
1976...Michael Manry.....Professor, University of Texas at Arlington, TX
1977...David Henry Williams
1979...Hyokang Chang.....Entrepreneur, Washington DC Area
1980...John Roach
1981...Jon Webb
1981...Nian-Chyi Huang.....Senior Management- Alcatel, Dallas, TX
1981...Worthy Martin...Associate Professor, University of Virginia, Charlottesville, VA
1984...Sudha Yalamanchili.....Chaired Professor, Georgia Tech, Atlanta, GA
1984...Sunghan Park.....Professor, Hanyang University, Korea
1986...Yeon Chul Kim.....CTO, Young Poong Electronics, Korea
1987...Baba Vemuri.....Named Professor, University of Florida, Gainesville, FL
1987...Chiun-Hong Chien.....NASA Johnson Space Center, Houston, TX
1987...Soo-Young Lee.....Professor, Auburn University, AL
1987...Yuan-Fang Wang.....Professor, University of California, Santa Barbara, CA
1988...N. Nandhakumar.....Senior Vice President, LG, San Diego, CA
1989...Dave Baker
1990...Jeff Rodriguez.....Associate Professor, University of Arizona, Tuscon, AZ
1990...Myung Sunwoo.....Professor, Ajou University, Korea
1991...Chen Chau Chu.....Staff Engineer, Qualcomm, Austin, TX
1991...Vipin Chaudhary.....Professor, University of Buffalo, SUNY, Buffalo, NY
1992...Farshid Arman.....Vice President, Ventana Medical Systems, San Francisco, CA
1993...Umesh Dhond.....Siemens, Princeton, NJ
1993...Bikash Sabata.....Vice President, Ventana Medical Systems, San Francisco, CA
1993...Raj Talluri.....Senior Vice President, Qualcomm, San Diego, CA
1993...Xavier Lebegue.....Senior Executive at French Company in Paris, France
1993...Yuh-Lin Chang
1996...Wen Liao.....Taiwan
1996...Dinesh Nair.....Senior Engineer at National Instruments, Austin, TX
1998...Qin Cai.....Senior Engineer, Microsoft, Seattle, WA
1998...Shishir Shah.....Professor, University of Houston, Houston, TX
2002...Qasim Iqbal.....Chief Architect, SparkCognition, Austin, TX
2004...Sangho Park
2006...Koichi Sato.....Sealed Air Corp./Create Technology, Monterrey, CA
2008...Michael S. Ryoo.....Research Technologist, NASA JPL, Pasadena, CA
2009...Elden Yu.....Amazon, New York, NY

2011...Josh Harguess.....SPAWAR, San Diego, CA
2011...Chia Chih Chen..... Sealed Air Corp./Create Technology, Monterrey, CA
2012...Jong-Taek Lee.....ETRI, Korea
2014...Lu Xia.....Amazon, Seattle, WA

Comments on the accomplishments of my PhD students

I have had 45+ PhDs. Some of my students have done spectacularly well in industry and academia.

For example Raj Talluri at Qualcomm is a senior vice president, and Nandhu Nandhakumar is a senior vice president at LG. Farshid Arman is a vice president at Siemens and Nianchi Huang is senior management at Alcatel in Dallas. Raj Talluri is likely to run Qualcomm in the near future! Among my Korean students Yon Chul Kim has done extremely well. Xavier Lebegue in France is part of the top management at a French electronics company. Dinesh Nair at National Instruments is heading their Indian Operation. More recently, my students going into industry have been choosing more entrepreneurial jobs - smaller companies with high risk - high payoff.

In the academic arena, Sudha Yalamanchili is a chaired professor at Georgia Tech, Baba Vemuri is a Named professor at University of Florida, and Yuan Wang is a professor at UC Santa Barbara. Myung Sunwoo is doing great at Ajou University in Korea.

Hyokang Chang and Bikash Sabata have met the most entrepreneurial success.

Don Eller is independent investor.

Michael Ryoo at NASA JPL is doing absolutely great!

Recent graduates Koichi Sato and Chia-Chi Chen joined a small company Create Technologies, a wholly own subsidiary of Sealed Air Corporation, to develop innovative products in the hospital care of patients.

My newest graduate Lu Xia will be joining Amazon in Seattle in summer of 2014.

MS graduate Matt Riley formed a company Swiftype that just received significant funding from investors to grow. It is serving a number to top companies including BestBuy, Facebook, Harmony and Mayo Clinic.

Leadership

At the University of Texas at Austin

Professor Aggarwal has served as a member or chairman of several committees on the campus. These committees have had important impact on the Department or the University. These committees include:

- Member, Budget Council, Electrical and Computer Engineering, 1972-present.
- Member, Digital Facilities and Infrastructure Committee/Project DISC
- Chairman, College of Engineering, Mathematics Committee
- Member, University Faculty Computer Committee
- Member, College of Engineering Committee on ECPD
- Member, Electronics Research Center, Executive Committee

Chairman of the Faculty Computer Committee (1979-84)

Professor Aggarwal served as the Chairman of the Faculty Computer Committee for a period of five years. This committee was charged with the planning of computational facilities for the campus. In early 1980's the campus computational facilities were fairly antiquated. During his tenure, several substantive actions were taken including:

A comprehensive three year plan costing \$2.6 million (discounted price) for meeting the computational needs of The University of Texas was prepared and its implementation initiated and completed.

The Project QUEST for the introduction of microcomputers was initiated and a joint effort with IBM developed for a period of three years leading to a grant of approximately \$10 million (over a period of a number of years) in services, software and equipment to the University of Texas.

A proposal for the acquisition of a supercomputer and the establishing of a supercomputer center was formulated and submitted to the University of Texas administration. This proposal was accepted and funded.

Professor Aggarwal arranged visits and accompanied Associate Vice Presidents Mr. Ross Shipman and Dr. Kenneth Tolo to UC Berkeley and Stanford, and to University of Illinois and Purdue University. Also, we were accompanied by Dr. Charles Warlick, then Director of Computation Center. These fact finding missions were approved by Dr. Gerhard Fonken, Vice President and Provost. These visits were important input for the planning of the facilities at the University of Texas Campus. It showed to the upper management the need for investment in the future of the campus computational facilities.

New Course material

Professor started number new courses in Nonlinear Systems, Signal Processing, Image Processing and Nonlinear Systems at the undergraduate level and in Computer Vision, Linear Systems and Nonlinear Systems at the graduate level. For a significant time period, in the early stages of the career, he was the only person in area of signal processing. This led to the writing of a monograph on Nonlinear Systems in the series edited George Turin at UC Berkeley. Recently Professor Aggarwal has co-authored a book on Computer Vision.

National and International Committees

Professor Aggarwal served as the President of International Association for Pattern Recognition and served in several leadership positions in the IEEE Computer Society.

Professor Aggarwal reviews proposals for government and non-government agencies including:

- Army Research Office
- National Research Council
- National Science Foundation
- IBM Corporation
- Shell Corporation
- United States-Israel Binational Science Foundation
- National Science and Engineering Research Council of Canada

Professor Aggarwal has served on technical evaluation panels set up by agencies including:

- U. S. Army Research Office Automatic Target Recognition Working Group
- National Research Council's Committee on Vision, panel to evaluate automatic target recognition technology.
- National Academy of Sciences Research Briefing Panel on Computer Vision and Pattern Recognition.
- National Science Foundation
 - Small Business Innovative Research Proposals
 - Research Initiation Grant Proposals
 - Equipment Grant Proposals