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## Professional Expertise

Artificial Intelligence, Deep Learning, Financial Data Analysis, Computer vision, Medical image analysis, and Computer graphics,

## Academic Appointments

| DURATION    | EMPLOYER  | POSITION                      |
|-------------|---|-------------------------------|
| 1999-       | <i>Department of Computer Science, University of California, Santa Barbara</i>          | Professor                     |
| 1998        | <i>LG Research Center of America, Princeton Junction, NJ</i>                            | Faculty Consultant (Resident) |
| 1993 - 1999 | <i>Department of Computer Science, University of California, Santa Barbara</i>          | Associate Professor           |
| 1987 - 1993 | <i>Department of Computer Science, University of California, Santa Barbara</i>          | Assistant Professor           |
| 1985- 1987  | <i>Computer and Vision Research Center, University of Texas at Austin</i>               | Graduate Research Assistant   |
| 1982 - 1985 | <i>Laboratory for Image and Signal Analysis, University of Texas at Austin</i>          | Graduate Research Assistant   |
| 1981 - 1982 | <i>Department of Electrical and Computer Engineering, University of Texas at Austin</i> | Graduate Teaching Assistant   |

## Industrial Experience

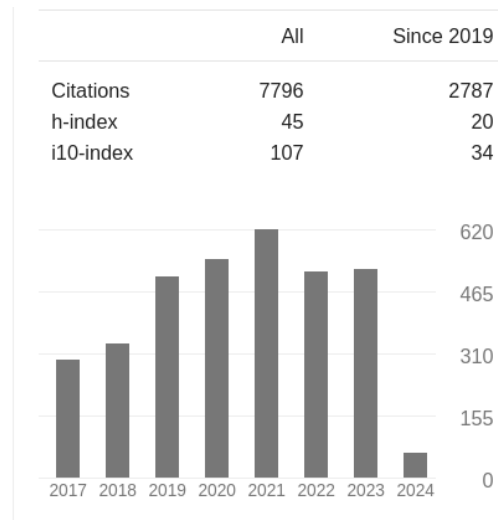
| TIME  | ORGANIZATION              | POSITION                       |
|-------|---------------------------|--------------------------------|
| 2021- | <i>Artista Associates</i> | Founder and Chief AI scientist |
| 2011- | <i>Visualsize Inc.</i>    | CEO & CTO                      |
| 2007  | <i>Visualsize Inc.</i>    | Founder                        |
| 2004  | <i>Proximex Corp.</i>     | Co-Founder                     |

## Education

| DATE      | UNIVERSITY                           | SPECIALIZATION                      | DEGREE |
|-----------|--------------------------------------|-------------------------------------|--------|
| 1977-1981 | <i>National Taiwan University</i>    | Electrical Engineering              | B.S    |
| 1981-1983 | <i>University of Texas at Austin</i> | Electrical and Computer Engineering | M.S    |
| 1983-1987 | <i>University of Texas at Austin</i> | Electrical and Computer Engineering | Ph.D   |

## Google Scholar Research Impact Statistics (as of Feb 2023)

|           | All   | since 2019 |
|-----------|-------|------------|
| Citations | 7,796 | 2,787      |
| h-index   | 45    | 20         |
| i10-index | 107   | 34         |



**Relevance** According to Professor Jens Palsberg, Professor of Computer Science at UCLA ( <http://web.cs.ucla.edu/palsberg/h-number.html> ), an h-index at and above 40 is achieved by only the top 5% of CS researchers and is considered excellent both in terms of research quality and quantity of publications.

## Professional Membership and Honors

- IEEE, Senior Member
- NSF Faculty Initiation Award, 1988-1990
- CVPR 2019 Best Student Paper Award, 2019 (top one out of over 5,000 publications)

## **Courses Taught, Directed, and Participated**

### **Lower-division**

- Java Programming
- Basic Data Structures and Python Programming

### **Upper-division**

- Advanced Data Structures
- Computer Algorithms
- Introduction to Machine Learning
- Introduction to Computer Vision
- Introduction to Computer Graphics
- Faculty Research Seminar
- Undergraduate Research Projects
- Internship in Industry

### **Graduate**

- Recent Trends in Deep Learning and Neural Nets
- Advanced Machine Learning
- Advanced Computer Vision
- Advanced Computer Graphics
- Advanced Pattern Recognition
- Multi-view Geometry for Computer Vision and Computer Graphics
- Graduate Research Seminar
- Directed MS Thesis Research
- Directed Ph.D. Dissertation Research

## Thesis Students Supervised

| NAME               | DEGREE | THESIS TITTLE   | DATE            |
|--------------------|--------|---|-----------------|
| Pandey, Arvind     | M.S.   | <i>A Study on Using Structured Lighting to Analyze Time Varying Image Sequences</i>             | July, 1989      |
| Cheng, David I.    | M.S.   | <i>3D Shape Construction and Recognition by Fusing Intensity and Structured Lighting</i>        | June, 1990      |
| Delucia, Dante     | M.S.   | <i>The Vision Workbench</i>   | June, 1990      |
| Karandikar, Nitin  | M.S.   | <i>Analysis of Video Image Sequences Using Point and Line Correspondences</i>                   | July, 1990      |
| Huynh, Duong Le    | M.S.   | <i>PIX: A PHIGS Interface to X</i>  | September, 1991 |
| Yang, Simon        | M.S.   | <i>Error Analysis of 3D Model Construction and Recognition from Structured Lighting</i>         | September, 1991 |
| Southard, Jonathan | M.S.   | <i>An Object-Oriented Software Architecture for Photo-realistic Rendering</i>                   | September, 1992 |
| Lee, Jeng-Feng     | Ph.D.  | <i>A Physically-Based Scheme for 3D Surface Reconstruction, Representation, and Recognition</i> | June, 1993      |
| Roy, Indrajit      | M.S.   | <i>Near Real-Time Physically-Based Animation of Articulated Rigid Bodies</i>                    | July, 1993      |
| Rhodes, Matthew    | M.S.   | <i>WEB: A Computer Simulation of the Web-Creation Process of the Garden Cross Spider</i>        | February, 1995  |
| Zhang, Henry       | M.S.   | <i>Study of a Novel Adaptive Vision Algorithm</i>   | June, 1995      |
| Lee, CheolWhan     | Ph.D.  | <i>Scheduling for Parallel Computer Vision and Image Processing Operation</i>                   | March, 1996     |
| Wu, Mark           | M.S.   | <i>3D Shape and Motion Analysis from Image Blur and Smear: A Unified Approach</i>               | June, 1997      |
| Xiong, Pan         | M.S.   | <i>Study of a Novel Genetic Algorithm with a Perturbation Operator</i>                          | June, 1997      |
| DeCastro, Alex     | M.S.   | <i>Web-based Collaborative 3D Modeling</i>  | December, 1998  |
| Chade-Meng, Tan    | M.S.   | <i>Finding and Using High Quality Word-Pairs for Enhanced Text Categorization</i>               | June, 2000      |

| NAME            | DEGREE | THESIS TITTLE  | DATE            |
|-----------------|--------|--|-----------------|
| Krushner, Doug  | M.S.   | <i>Bion: An Implantable Neural Stimulation Device</i>  | June, 2002      |
| Alferez, Ronald | Ph.D.  | <i>Object Recognition using Local Invariants and Global Models</i>   | August, 2002    |
| Koppel, Dan     | M.S.   | <i>Viewing Enhancement in Video-Endoscopy</i>  | December, 2002  |
| Can, Tolga      | M.S.   | <i>Fast Protein Visualization Using Java3D</i>   | December, 2003  |
| Can, Tolga      | Ph.D.  | <i>Efficient and Automated Analysis of Protein Structures</i>  | August, 2004    |
| Koppel, Dan     | Ph.D.  | <i>The Use of Computer Vision Algorithms and Deformable Modeling to Improve the Endoscopic-Video Interface</i> | October, 2006   |
| Dusty, Sargent  | Ph.D.  | <i>Tracker-Endoscope Calibration for Colonoscopy</i>   | September, 2008 |
| Changmin, Tsai  | Ph.D.  | <i>A Framework for Computing Dense Optical Flow Fields with Flexible and Robust Regularization</i>             | September, 2009 |
| Chao-I, Chen    | Ph.D.  | <i>Automated Model Building from Video in Computer-Aided Diagnosis in Colonoscopy</i>                          | November 2009   |
| Xin Mao         | M.S.   | <i>Study on the GPU-boosted Image Feature Detection</i>  | December 2009   |
| Johann Ly       | M.S.   | <i>Perceptual Optimizations for Soft-body Physics Simulation</i>   | June 2011       |
| Yi, Gong        | Ph.D.  | <i>Modeling and Rendering MVS Point Clouds Reconstructed from Uncalibrated Images</i>                          | December, 2011  |
| Zhang, Da       | Ph.D.  | <i>Towards Segment-level Video Understanding: Detecting Activities from Untrimmed Videos</i>                   | December, 2019  |
| Wang, Xin       | Ph.D.  | <i>Language &amp; Vision: Learning to Describe and Interact in the Multimodal World</i>                        | June, 2020      |
| Rhys Tracy      | M.S.   | <i>VREN: Volleyball Rally Dataset with Expression Notation Language</i>  | June 2023       |

## Grants and Awards

| DATE      | PROJECT  | SOURCE   | AMOUNT      | ROLE  |
|-----------|--|--|-------------|-------|
| 1987      | <i>Faculty Initiation Equipment Grant</i>  | College of Engineering, UCSB                                       | \$65,000    | PI    |
| 1988–1989 | <i>Analysis of Time Varying Image Sequences Using Active Sensing</i>   | Faculty Senate, UCSB   | \$5,500     | PI    |
| 1989–1990 | <i>A New Paradigm for 3D Scene Analysis Using Active Sensing</i>   | Faculty Senate, UCSB   | \$2,000     | PI    |
| 1989–1991 | <i>Integrated Analysis of Intensity and Structured Light Images for Scene Interpretation</i>   | National Science Foundation (Research Initiation Award)            | \$60,000    | PI    |
| 1992      | <i>3D Shape Recognition using Intrinsic Surface Properties</i>   | Regents' Junior Faculty Fellowship Award, University of California | \$5,000     | PI    |
| 1993–1998 | <i>An Infrastructure Facility for Parallel Processing Research</i>   | National Science Foundation  | \$1,050,000 | Co-PI |
| 1993–1994 | <i>Image Analysis for Automated Robotic Tracking in Endoscopic Surgery</i>   | California MICRO program and Computer Motion Inc.                  | \$18,000    | PI    |
| 1993–1994 | <i>Research on Active Object Recognition</i>   | Faculty Senate, UCSB   | \$6,000     | PI    |
| 1994–1996 | <i>Implementing and Applying a Modeling and Database System in Support of EOS Scale Earth Science</i>  | NASA   | \$992,215   | Co-PI |
| 1994–1998 | <i>The Alexandria Digital Library Project: Towards a Distributed Digital Library with Comprehensive Services for Images and Spatially-Referenced Information</i> | NSF/NASA/ARPA  | \$4,000,000 | Co-PI |
| 1995–1996 | <i>LLNL Oil Well Log Imaging Project</i>   | Lawrence Livermore National Labs                                   | \$100,000   | Co-PI |
| 1996–1997 | <i>A Project on Wafer Inspection, Defect Analysis, and Stereo Metrology,</i>   | Electroglas Inc., San Jose, CA                                     | \$43,000    | PI    |
| 1999–2004 | <i>DLI Phase 2: The Alexandria Digital Earth Prototype</i>   | NSF/NASA/ARPA  | \$5,000,000 | Co-PI |
| 2000-2001 | <i>Image Analysis, Rectification, and Re-rendering in Endoscopy Surgery,</i>   | UC Micro and Karl-Storz Imaging, Inc., Goleta, CA                  | \$54,000    | Co-PI |

| DATE      | PROJECT   | SOURCE  | AMOUNT      | ROLE  |
|-----------|---|---|-------------|-------|
| 2000-2001 | <i>Sticky Notes: A Tool for Collaboration,</i>  | Center for Information Technology and Society, UCSB       | \$9,985     | Co-PI |
| 2000–2003 | <i>Invariant, Intra-Class Retrieval in Digital Image Databases</i>  | National Science Foundation                               | \$210,000   | PI    |
| 2000-2005 | <i>CISE Research Infrastructure: Digital Campus: Scalable Information on a Campus-Wide Wireless Network,</i>                              | National Science Foundation                               | \$1,000,000 | Co-PI |
| 2001-2002 | <i>Enhancing Image Interpretation and Visual Feedback in Video-Endoscopy,</i>   | UC Micro Program and Karl-Storz Imaging, Inc., Goleta, CA | \$54,000    | PI    |
| 2002-2003 | <i>Viewing Enhancement in Video-Endoscopy,</i>  | UC Micro Program and Karl-Storz Imaging, Inc., Goleta, CA | \$54,000    | Co-PI |
| 2004      | <i>Multi-Modal, Multi-Dimensional Biometry Systems</i>  | AuguSense Corp., Cupertino, CA                            | \$84,000    | Co-PI |
| 2005      | <i>Multi-Modal, Multi-Dimensional Biometry Systems (continuation grant)</i>   | AuguSense Corp., Cupertino, CA                            | \$56,000    | Co-PI |
| 2005      | <i>Multi-Modal, Multi-Dimensional Biometry Systems (continuation grant)</i>   | AuguSense Corp., Cupertino, CA                            | \$36,000    | Co-PI |
| 2004-2005 | <i>Integration of Advanced Sensor and Sensing Technology</i>  | US Navy   | \$209,244   | Co-PI |
| 2005      | <i>Multi-Modal, Multi-Dimensional Biometry Systems (continuation grant)</i>   | AuguSense Corp., Cupertino, CA                            | \$30,000    | PI    |
| 2006      | <i>Multi-Modal, Multi-Dimensional Biometry Systems (continuation grant)</i>   | AuguSense Corp., Cupertino, CA                            | \$28,000    | PI    |
| 2006      | <i>Toward Automated Construction and Animation of 3D Colon Models for Computer-Assisted Diagnosis in Colonoscopy</i>                      | US Army Medical Research and Material Command             | \$69,013    | PI    |
| 2006      | <i>Toward Automated Construction and Animation of 3D Colon Models for Computer-Assisted Diagnosis in Colonoscopy (continuation grant)</i> | US Army Medical Research and Material Command             | \$57,262    | PI    |

| DATE      | PROJECT   | SOURCE   | AMOUNT    | ROLE |
|-----------|---|--|-----------|------|
| 2006-2007 | <i>Toward Automated Construction and Animation of 3D Colon Models for Computer-Assisted Diagnosis in Colonoscopy (continuation grant)</i> | US Army Medical Research and Material Command    | \$100,302 | PI   |
| 2007      | <i>Real-time Stereo Display for Microscopic Image Visualization</i>   | TrueVision Systems, Santa Barbara, CA            | \$5,250   | PI   |
| 2007      | <i>Real-time Stereo Display for Microscopic Image Visualization (continuation grant)</i>  | TrueVision Systems, Santa Barbara, CA            | \$10,948  | PI   |
| 2007      | <i>Real-time Stereo Display for Microscopic Image Visualization (continuation grant)</i>  | TrueVision Systems, Santa Barbara, CA            | \$9,868   | PI   |
| 2007-2008 | <i>Toward Automated Construction and Animation of 3D Colon Models for Computer-Assisted Diagnosis in Colonoscopy (continuation grant)</i> | US Army Medical Research and Material Command    | \$149,111 | PI   |
| 2008      | <i>Real-time Stereo Display for Microscopic Image Visualization (continuation grant)</i>  | TrueVision Systems, Santa Barbara, CA            | \$9,868   | PI   |
| 2008      | <i>Toward Automated Construction and Animation of 3D Colon Models for Computer-Assisted Diagnosis in Colonoscopy (continuation grant)</i> | US Army Medical Research and Material Command    | \$84,000  | PI   |
| 2009      | <i>Enhancing Vehicular Safety Using Computer-Vision Shape and Motion Analysis Algorithms</i>  | Industrial Technology Research Institute, Taiwan | \$40,000  | PI   |
| 2010      | Un-restricted gift  | Electronic Technology Research Institute, Korea  | \$9,000   | PI   |
| 2011      | <i>3D Space Reconstruction and Object Recognition with Monocular Camera in the Application of Advanced Safety Vehicle</i>                 | Industrial Technology Research Institute, Taiwan | \$60,000  | PI   |
| 2012      | <i>Image Processing Technologies in Severe Weather</i>  | Industrial Technology Research Institute, Taiwan | \$60,000  | PI   |



| DATE      | PROJECT   | SOURCE   | AMOUNT               | ROLE |
|-----------|---|--|----------------------|------|
| 2013      | <i>Automatic Detection Technology of Image Defect</i>                           | Industrial Technology Research Institute, Taiwan | \$60,000             | PI   |
| 2014      | <i>Technology of Multiple Object Classification and Tracking</i>                | Industrial Technology Research Institute, Taiwan | \$60,000             | PI   |
| 2015      | <i>Robust and Efficient Feature Matching with Large Lens Distortion</i>         | Industrial Technology Research Institute, Taiwan | \$60,000             | PI   |
| 2019-2020 | <i>Leverage XSEDE's GPU Clusters for Advanced Machine Learning</i>              | NSF  | GPU time and storage | PI   |
| 2020-2021 | <i>Leverage XSEDE's GPU Clusters for Undergraduate Machine Learning Courses</i> | NSF  | GPU time and storage | PI   |
| 2020-2021 | <i>Leverage XSEDE's GPU Clusters for Advanced Machine Learning</i>              | NSF  | GPU time and storage | PI   |

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## Recent Consulting Engagement and Research Collaboration

| DATE      | COMPANY  | BUSINESS FOCUS   |
|-----------|--|--|
| 1993-1995 | <i>Computer Motion Inc., Goleta, CA</i>                          | Specialized in advanced robots and control systems for medical applications (Computer Motion has recently merged with Intuitive Surgical)  |
| 1997-1998 | <i>Electroglas Inc., San Jose, CA</i>                            | Design and manufacture wafer probing equipment to help major semiconductor manufacturers to maximize the overall efficiency of their wafer and device testing processes                        |
| 1998      | <i>LG Research Center of USA, Princeton Junction, NJ</i>         | Engaged in many aspects of research in video analysis, compression, and delivery, the USA research center of the Korea Electronics giant LG (LG Research Center is now Triveni Digital)        |
| 2003-2004 | <i>InTouch Health Inc., Goleta, CA</i>                           | Pioneers the use of remote presence in healthcare and develops proprietary communications and mobile robotic platforms for healthcare delivery   |
| 2000-2003 | <i>Karl-Storz Imaging Inc., Goleta, CA</i>                       | Develops and manufactures endoscopic instrumentation for biomedical research, industrial, and veterinary markets   |
| 2004-     | <i>Proximex Corp., Cupertino, CA</i>                             | Researches advanced, accurate, and scalable physical security software systems by integrating key technologies from multi-model biometrics, video surveillance, and systems management         |
| 2004      | <i>Al Mann Foundation, Valencia, CA</i>                          | Conducts medical research to improve the quality of life of people suffering from debilitating medical disabilities by developing innovative bionic solutions                                  |
| 2005      | <i>Toyon Research Corp., Goleta, CA</i>                          | Engages in applied research and technical analysis, modeling, and simulation of sensors and weapon systems   |
| 2005      | <i>Ask Jeeves Inc., Oakland, CA</i>                              | As the 7th largest global web property, Ask Jeeves, Inc., delivers world-class information retrieval products through a diverse portfolio of Web sites, portals, and downloadable applications |
| 2006-2008 | <i>STI Medical Systems, Honolulu, HI</i>                         | Is a world leader in developing advanced optical diagnostic imaging technology for cancer detection  |
| 2007-2008 | <i>TrueVision Systems, Santa Barbara, CA</i>                     | Pioneers real-time 3D high-definition vision system for microsurgery and hospital teaching   |
| 2009-2015 | <i>Industrial Technology Research Institute, Hsinchu, Taiwan</i> | Enhance Vehicular Safety Using Computer-Vision Shape and Motion Analysis Algorithms  |

## Recent Professional Appointments

| YEAR      | POSITION                 | ORGANIZATION/MEETING  |
|-----------|--------------------------|---|
| 1998-2001 | <i>Associate Editor</i>  | IEEE Transactions on Pattern Analysis and Machine Intelligence                                |
| 1998      | <i>Program Co-Chair</i>  | IEEE Computer Society Conference on Computer Vision and Pattern Recognition                   |
| 2000-2007 | <i>Associate editor</i>  | Pattern Recognition journal   |
| 2003      | <i>Panelist</i>          | NSF Review Panel  |
| 2003      | <i>Program committee</i> | SPIE Conference on Electronic Imaging and Multimedia Technology, Photonics Asia               |
| 2003      | <i>Co-Chair</i>          | The First ACM International Workshop on Video Surveillance, Berkeley, CA                      |
| 2004      | <i>Co-Chair</i>          | The Second ACM International Workshop on Video Surveillance and Sensor Networks, New York, NY |
| 2004      | <i>Program committee</i> | Articulated and Nonrigid Motion, New York, NY   |
| 2004      | <i>Program committee</i> | IEEE International Conference on Multimedia and Expo, Taipei, Taiwan                          |
| 2004      | <i>Program committee</i> | SPIE Conference on Electronic Imaging and Multimedia Technology, Photonics Asia               |
| 2004      | <i>Session chair</i>     | IEEE International Conference on Multimedia and Expo, Taipei, Taiwan                          |
| 2004      | <i>Guest editor</i>      | Special Issue on Video Surveillance, ACM Multimedia Systems Journal                           |
| 2005      | <i>Co-Chair</i>          | The Third ACM International Workshop on Video Surveillance and Sensor Networks, New York, NY  |
| 2007      | <i>Program committee</i> | International Conference on Computer Vision, Rio de Janeiro, Brazil                           |
| 2007      | <i>Program committee</i> | IEEE Computer Society Conference on Computer Vision and Pattern Recognition, Minneapolis, MN  |
| 2007      | <i>Program committee</i> | IEEE International Conference on Multimedia and Expo, Beijing, China                          |
| 2007-2009 | <i>Associate Editor</i>  | Journal of Ambient Intelligence and Smart Environment   |
| 2008      | <i>Program committee</i> | European Conference on Computer Vision, Marseilles, France                                    |
| 2008      | <i>Program committee</i> | IEEE Computer Society Conference on Computer Vision and Pattern Recognition, Anchorage, AL    |
| 2008      | <i>Program committee</i> | Second ACM/IEEE International Conference on Distributed Smart Cameras, Palo Alto, CA          |

| YEAR | POSITION                 | ORGANIZATION/MEETING   |
|------|--------------------------|--|
| 2009 | <i>Program committee</i> | Third ACM/IEEE International Conference on Distributed Smart Cameras, Como, Italy  |
| 2010 | <i>Keynote speaker</i>   | ITRI Conference on Smart Sensors for Vehicular Safety Applications, Taipei, Taiwan |
| 2014 | <i>Program committee</i> | International Conference on Pattern Recognition, Stockholm, Sweden                 |

## Recent Conference Lectures/Demos/Invited Talks

| MONTH/YEAR     | TITLE  | MEETING/PLACE   |
|----------------|--|---|
| February 2002  | <i>A Collaborative Environment for Protein Visualization</i>   | San Diego SuperComputing Center, San Diego, CA  |
| July 2003      | <i>Invariant Feature Extraction and Biased Statistical Inference for Video Surveillance</i>            | IEEE International Conference on Advanced Video and Signal-based Surveillance, Miami, FL      |
| August 2003    | <i>An Overview of Some Current Research at the Computer Vision Laboratory at UCSB</i>                  | Academia Sinica, Taipei, Taiwan   |
| August 2003    | <i>Multi-Camera Video Surveillance Systems</i>   | Photon-Electronics Research Center, Industrial Technology Research Institute, Tsinchu, Taiwan |
| August 2003    | <i>Biolab: A Bioinformatics Workbench</i>  | Biomedical Research Center, Industrial Technology Research Institute, Tsinchu, Taiwan         |
| September 2003 | <i>BioLab: A Bioinformatics Workbench</i>  | San Diego SuperComputing Center, San Diego, CA  |
| September 2003 | <i>Video Surveillance with Distributed Camera Networks</i>   | NSF Information and Data Management Workshop Seattle, WA                                      |
| November 2003  | <i>Multi-Camera Spatio-Temporal Fusion and Biased Sequence-Data Learning for Security Surveillance</i> | ACM Multimedia Conference, Berkeley, CA   |
| December 2003  | <i>Toward Robust and Real-Time Event Detection and Recognition for Video Surveillance</i>              | Photon-Electronics Research Center, Industrial Technology Research Institute, Tsinchu, Taiwan |
| December 2003  | <i>Real-Time Multi-Person Tracking in Video Surveillance</i>   | Pacific Rim Multimedia Conference, Singapore  |
| December 2003  | <i>An Overview of Some Current Research at the Computer Vision Laboratory at UCSB</i>                  | National University of Singapore, Singapore   |

| MONTH/YEAR     | TITLE   | MEETING/PLACE  |
|----------------|---|--|
| April 2004     | <i>Distributed Data Fusion and Mining</i>   | SPIE Defense and Security Symposium, Orlando, FL                     |
| April 2004     | <i>An Anatomy of a Video Surveillance System</i>  | University of Central Florida, Orlando, FL                           |
| April 2004     | <i>An Anatomy of a Video Surveillance System</i>  | University of South Florida, Tampa, FL                               |
| April 2004     | <i>Image-Based Rendering and Modeling in Video-Endoscopy</i>  | IEEE International Symposium on Biomedical Imaging, Arlington, VA    |
| April 2004     | <i>Toward Real-Time, Physically-Correct Soft Tissue Behavior Simulation</i>   | IEEE International Symposium on Biomedical Imaging, Arlington, VA    |
| May 2004       | <i>Image Interpretation in Video Surveillance</i>   | Proximex Corp., Cupertino, CA  |
| June 2004      | <i>Human Activity Detection and Recognition for Video Surveillance</i>  | IEEE International Conference on Multimedia and Expo, Taipei, Taiwan |
| June 2004      | <i>SSD Tracking Using Dynamic Template and Log-Polar Transform</i>  | IEEE International Conference on Multimedia and Expo, Taipei, Taiwan |
| June 2004      | <i>Distributed Data Fusion and Mining</i>   | National Taiwan University, Taipei, Taiwan                           |
| July 2004      | <i>Biolab: A Bioinformatics Workbench (and More)</i>  | Academia Sinica, Taipei, Taiwan                                      |
| July 2004      | <i>Visual Feedback Enhancement in Video Endoscopy</i>   | National Taiwan University, Taipei, Taiwan                           |
| July 2004      | <i>Selective Focus-of-Attention using Master-Slave Cameras for Video Surveillance</i>   | Proximex Corp., Cupertino, CA  |
| September 2004 | <i>Selective Video Zooming and Analysis Using Master-Slave Cameras for Face Detection, Tracking, Modeling and Recognition</i> | Proximex Corp., Cupertino, CA  |
| January 2005   | <i>Robust and Real-Time Image Stabilization and Rectification</i>   | Workshop on Applications of Computer Vision, Breckenridge, CO        |
| March 2005     | <i>An Overview of Some Current Research at the Computer Vision Laboratory at UCSB</i>   | NEC Research Meeting, Santa Barbara, CA                              |
| October 2005   | <i>VSSN Workshop Planning and Future</i>  | ACM Multimedia Conference, New York NY                               |

| MONTH/YEAR     | TITLE  | MEETING/PLACE   |
|----------------|--|---|
| June 2005      | <i>Multi-Camera Tracking Frameworks</i>  | Proximex Corp., Cupertino, CA   |
| August 2005    | <i>Web Image Quality Assurance and Duplicate Detection</i>   | Ask Jeeves, Pistataway, New Jersey  |
| September 2005 | <i>Robust and Real-Time Computer Assisted Image Interpretation, Distributed Video Data Fusion and Mining</i> | NPS-LLNL-UCSB Workshop, Monterey, CA  |
| November 2005  | <i>Toward Robust and Real-time Multi-camera Video Surveillance in the Real World</i>                         | Academia Sinica, Taipei, Taiwan   |
| November 2005  | <i>A Video Analysis Framework for Soft Biometry Security Surveillance</i>                                    | ACM Workshop on Visual Surveillance and Sensor Networks, Singapore                                  |
| November 2005  | <i>Toward Robust and Real-time Multi-camera Video Surveillance in the Real World</i>                         | Photon-Electronics Research Center, Industrial Technology Research Institute, Tsingchu, Taiwan      |
| November 2005  | <i>Toward Robust and Real-time Multi-camera Video Surveillance in the Real World</i>                         | National Taiwan University, Taipei, Taiwan  |
| February 2006  | <i>Modeling the Structure and Appearance of Objects from Video</i>   | STI Medical Systems, Honolulu, HI   |
| February 2007  | <i>Structure and Motion Analysis from Video</i>  | Naval Postgraduate School, Monterey, CA   |
| June 2008      | <i>Regularizing Optical-Flow Computation using Tensor Theory and Complex Analysis</i>                        | CVPR Workshop on Tensors in Image Processing and Computer Vision, Anchorage, AL                     |
| June 2008      | <i>A New Framework for Behavior Modeling of Organs and Soft Tissue using the Boundary-Element Methods</i>    | CVPR Workshop on Tensors in Image Processing and Computer Vision, Anchorage, AL                     |
| February 2009  | <i>Uniscale Multi-view Registration Using Double Dog-Leg Method</i>  | SPIE Medical Imaging Conference, San Diego, CA  |
| February 2009  | <i>Feature Detector and Descriptor for Medical Images</i>  | SPIE Medical Imaging Conference, San Diego, CA  |
| December 2009  | <i>Enhancing Vehicular Safety Using Computer-Vision Shape and Motion Analysis Algorithms</i>                 | ITRI Conference on Smart Sensors for Vehicular Safety Application (Keynote speaker), Taipei, Taiwan |

| MONTH/YEAR     | TITLE   | MEETING/PLACE   |
|----------------|---|---|
| December 2009  | <i>Building the Third Dimension Using Consumer-Market Digital Cameras, Camcorders, and Phones</i> | Industrial Technology Research Institute (invited talk), Hsingchu, Taiwan     |
| December 2009  | <i>Building the Third Dimension Using Consumer-Market Digital Cameras, Camcorders, and Phones</i> | Academia Sinica (invited talk), Hsingchu, Taiwan                              |
| December 2009  | <i>Building the Third Dimension Using Consumer-Market Digital Cameras, Camcorders, and Phones</i> | National Taiwan University (invited talk), Hsingchu, Taiwan                   |
| January 2010   | <i>Building the Third Dimension Using Consumer-Market Digital Cameras, Camcorders, and Phones</i> | Intel Corp. (invited talk), Santa Clara, CA                                   |
| February 2010  | <i>Building the Third Dimension Using Consumer-Market Digital Cameras, Camcorders, and Phones</i> | MediaTek Regional Office (invited talk), Boston, MA                           |
| June 2010      | <i>Building the Third Dimension Using Consumer-Market Digital Cameras, Camcorders, and Phones</i> | Sony Playstation Group (invited talk), Los Angeles, CA                        |
| June 2010      | <i>Building the Third Dimension Using Consumer-Market Digital Cameras, Camcorders, and Phones</i> | Nokia Research Lab (invited talk), Santa Monica, CA                           |
| July 2010      | <i>Building the Third Dimension Using Consumer-Market Digital Cameras, Camcorders, and Phones</i> | Sony Electronics (invited talk), San Diego, CA                                |
| September 2010 | <i>Building the Third Dimension Using Consumer-Market Digital Cameras, Camcorders, and Phones</i> | Google (invited talk), Mountain View, CA                                      |
| September 2010 | <i>Building the Third Dimension Using Consumer-Market Digital Cameras, Camcorders, and Phones</i> | Multi-Viewpoint Image Acquisition and Utilization Workshop, Santa Barbara, CA |
| October 2010   | <i>Building the Third Dimension Using Consumer-Market Digital Cameras, Camcorders, and Phones</i> | Myrachitra Inc. (invited talk), Santa Barbara, CA                             |
| December 2012  | <i>Building the Third Dimension Using Consumer-Market Digital Cameras, Camcorders, and Phones</i> | Conference on Motion and Computer Vision (invited talk), Austin, TX           |



| MONTH/YEAR     | TITLE   | MEETING/PLACE   |
|----------------|---|---|
| May 2013       | <i>Building the Third Dimension Using Consumer-Market Digital Cameras, Camcorders, and Phones</i>               | Qualcomm (invited talk), San Diego, CA  |
| September 2014 | <i>Enhancing Vehicular Safety in Adverse Weather using Computer Vision Analysis</i>                             | IEEE Vehicular Technology Conference, Vancouver, Canada   |
| October 2014   | <i>Photo- and Video-based Ranging and Modeling</i>  | International Telemetering Conference, San Diego, CA  |
| October 2014   | <i>High-Performance Tomographic Imaging and Applications</i>  | International Telemetering Conference, San Diego, CA  |
| September 2015 | <i>Evaluation, Design and Application of Object Tracking Technologies for Vehicular Technology Applications</i> | IEEE Vehicular Technology Conference, Boston, MA  |
| October 2015   | <i>Computer Vision Analysis for Vehicular Safety Applications</i>   | International Telemetering Conference, Las Vegas, CA  |
| September 2016 | <i>Robust and Efficient Tracking with Large Lens Distortion for Vehicular Technology Applications</i>           | IEEE Vehicular Technology Conference, Montreal, Quebec, Canada  |
| June 2017      | <i>Multimodel Transfer: A hierarchical Deep Convolutional Network for Fast Artistic Style Transfer</i>          | IEEE CVPR Conference, Hawaii (presented by Xin Wang)  |
| June 2018      | <i>Video Captioning via Hierarchical Reinforcement Learning</i>   | IEEE CVPR Conference, Salt Lake City (presented by Xin Wang)  |
| June 2018      | <i>Watch, Listen, and Describe: Globally and Locally Aligned Cross-Modal Attentions for Video Captioning</i>    | North American Chapter of the Association for Computational Linguistics: Human Language Technologies, New Orleans, LA (presented by Xin Wang) |

| MONTH/YEAR     | TITLE   | MEETING/PLACE   |
|----------------|---|---|
| June 2018      | <i>No Metrics Are Perfect: Adversarial Reward Learning for Visual StoryTelling</i>                          | the Association for Computational Linguistics Annual Conference, Melbourne, Australia (presented by Xin Wang) |
| September 2018 | <i>3D: Single Shot multi-Span Detector via Fully 3D Convolutional Network</i>                               | British Machine Vision Conference, England (presented by Da Zhang)  |
| December 2018  | <i>Dynamic Temporal Pyramid Network: A Closer Look at Multi-Scale Modeling for Activity Detection</i>       | ACCV, Perth, Australia  |
| June 2019      | <i>MAN: Moment Alignment Network for Natural Language Moment Retrieval via Iterative Graph Adjustment</i>   | IEEE CVPR Conference, Long Beach, CA (presented by Da Zhang)  |
| June 2019      | <i>Reinforced Cross-Modal Matching and SElf-Supervised Imitation Learning by Vision-Language Navigation</i> | IEEE CVPR Conference, Long Beach, CA (presented by Xin Wang)  |
| November 2019  | <i>VATEX: A Large-Scale, High-Quality Multilingual Dataset for Video-and-Language Research</i>              | ICCV Conference, Seoul, Korea (presented by Xin Wang)   |
| June 2020      | <i>Metal: Minimum Effort Temporal Activity Localization in Untrimmed Videos</i>                             | IEEE CVPR Conference, (remote, presented by Da Zhang)   |
| Oct 2022       | <i>VERN: VolleyBall Rally Dataset with Expression Notation Language</i>                                     | IEEE International Conference on Knowledge Graphs, (remote, presented by Haotian Xia and Rhys Tracy)          |

## Major Professional Development and Software Engineering Activities

In addition to numerous consulting and collaboration activities with industry, Professor Wang was involved in two significant start-up activities.

**Proximex:** Professor Wang was one of the original co-founders of a security surveillance and video analytics company, Proximex, headquartered in Cupertino, CA, back in 2004.

Proximex developed a physical security information management (PSIM) solution providing integration to video; access control; and intrusion, fire and other event alert systems into one common interface. The system can accommodate a wide range of integration needs for small-to-medium and medium-to-large scale environments. The solutions provide greater situational awareness, decreased incident response time, and simplified event reconstruction and reporting.

Professor Wang lead the engineering team and guide the R&D activities for the first years of the company's existence. The company was sold to ADT Security for over \$30 million US dollars in 2009.

**VisualSize:** In 2007, Professor Wang founded a company **Visualsize Inc.** to commercialize his 3D computer vision research. Visualsize Inc. offers a number of 3D products, and Professor Wang has made all products available for free, non-commercial use on the Internet. Of these, the photo- and video-based 3D modeling and reconstruction pipeline is of particular relevance that has already made a significant societal impact.

3D reconstruction is widely considered an ill-posed, inverse problem in computer vision that is difficult to solve efficiently, robustly and accurately. Furthermore, photo- and video-based 3D modeling is complicated, as it comprises a pipeline of intertwined components, touching upon many facets of computer vision, e.g., 2D feature analysis and tracking, localized 2D to 3D structure and motion inference, global numerical optimization, 3D surface generation, and multi-view texture mapping. A complete 3D pipeline must successfully address all these problems and more.

Professor Wang has made a *single-handed* endeavor to design, code, deploy, and constantly upgrade a complete 3D modeling pipeline from scratch. The pipeline, PhotoModel3D, has the following salient features: It

1. was developed entirely in house with all IP rights held in our lab,
2. works with both discrete images and continuous videos taken by a consumer-market digital camera, camcorder, or camera phone of any make and model,
3. uses no special equipment (e.g., lens and tripod), active projection, artificial lighting, prior camera calibration, man-made markers, or contrived registration patterns,
4. requires no user training (just point and shoot),
5. is fully automated and end-to-end (from photographs to fully colored and textured 3D models) without manual intervention or data-specific parameter tuning,
6. is a software-based solution that runs on commodity Linux and Windows servers without the need of special hardware (GPU, DSP, etc.) acceleration,
7. has an ARM (RISC) version that is deployable on mobile devices for on-the-spot 3D analysis and model construction without invoking any external communication,
8. possesses excellent inter-operability with multiple devices, software and platforms in that it records 3D models in two different resolutions (high and low) and many different formats such as PLY and COLLADA (for CAD software), WRL and WebGL (for Web browser display), and STL (for use with most single-color 3D printers),
9. has been shown to infer 3D models of high fidelity, with an average 3D structure error less than 0.2% measured against ground-truthed 3D LIDAR models,
10. has been deployed on the web allowing free, non-commercial use since 2010; receiving over 100 thousands web visits and thousands of use, and
11. has successfully constructed thousands of 3D models of a large variety of 3D scenes using images and videos contributed from anonymous users all over the world. Currently, over 1,000 such 3D models are on exhibit at our website.

The impact of PhotoModel3D on the society is that the system enables anyone and everyone with a digital camera, camcorder, and phone (over three billions such devices are in circulation worldwide today) to become a 3D content producer without any training in science and engineering.

## Cumulative List of Publications

| #  | YEAR | TITLE and AUTHORS  | PUBLISHER  | CATEGORY <sup>a</sup>                       |
|----|------|--|--|---|
| 1  | 1984 | Matching Three-Dimensional Objects Using Silhouettes (with M. J. Magee, and J. K. Aggarwal)                                  | <i>IEEE Transactions on PAMI</i> , Vol. PAMI-6, No. 4, pp. 513-518   | Article                                     |
| 2  | 1984 | Three-Dimensional Volumetric Matching Using Silhouettes (with M. J. Magee and J. K. Aggarwal)                                | <i>Proceedings of the International Conference on Computer, Systems, and Signal Processing</i> , Bangalore, India  | Refereed Conference Proceedings             |
| 3  | 1985 | Construction of Surface Representation from 3-D Volumetric Scene Description (with J. K. Aggarwal)                           | <i>Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition</i> , San Francisco, CA, pp. 130-135                               | Refereed Conference Proceedings (20%)       |
| 4  | 1985 | Inferring Local Surface Orientation with the Aid of Grid Coding (with A. Mitiche and J. K. Aggarwal)                         | <i>Proceedings of the IEEE Computer Society Third Workshop on Computer Vision: Representation and Control</i> , Bellaire, MI, pp. 96-104                             | Refereed Workshop Proceedings               |
| 5  | 1986 | Surface Reconstruction and Representation of 3-D Scenes (with J. K. Aggarwal)  | <i>Pattern Recognition</i> , Vol. 19, No. 3, pp. 197-207   | Article                                     |
| 6  | 1986 | Structure and Motion Computation from Point and Line Correspondences in Images (with J. K. Aggarwal)                         | <i>Advances in Image Processing and Pattern Recognition</i> , edited by V. Cappellini and R. Marconi., Elsevier Science Publishers B. V., North-Holland, pp. 171-178 | Book Chapter                                |
| 7  | 1987 | Computation of Surface Orientation and Structure of Objects Using Grid Coding (with A. Mitiche and J. K. Aggarwal)           | <i>IEEE Transactions on PAMI</i> , Vol. PAMI-9, No. 1, pp. 129-137   | Article                                     |
| 8  | 1987 | Experiments in Computing Optical Flow with the Gradient-Based, Multi-constraint Method (with A. Mitiche, and J. K. Aggarwal) | <i>Pattern Recognition</i> , Vol. 20, No. 2, pp. 173-179   | Article                                     |
| 9  | 1987 | On Modeling 3-D Objects Using Multiple Sensory Data (with J. K. Aggarwal)  | <i>Proceedings of the IEEE International Conference on Robotics and Automation</i> , Raleigh, NC, pp. 1098-1103  | Refereed Conference Proceedings (oral: 25%) |
| 10 | 1987 | Analysis of a Sequence of Images Using Point and Line Correspondences (with J. K. Aggarwal)                                  | <i>Proceedings of the IEEE International Conference on Robotics and Automation</i> , Raleigh, NC, pp. 1275-1280  | Refereed Conference Proceedings (oral: 25%) |

<sup>a</sup>highly competitive conference acceptance rates, if known, are included

| #  | YEAR | TITLE and AUTHORS  | PUBLISHER  | CATEGORY                              |
|----|------|--|--|---------------------------------------|
| 11 | 1987 | 3-D Object Description from Stripe-Coding and Multiple Views (with J. K. Aggarwal)                         | <i>Proceedings of the 5th Scandinavian Conference on Image Analysis</i> , Stockholm, Sweden, pp. 669-682                             | Refereed Conference Proceedings       |
| 12 | 1987 | Integration of Active and Passive Sensing Techniques for Representing Three-Dimensional Objects            | <i>Technical report TR 87-1-33</i> , Computer and Vision Research Center, The University of Texas at Austin                          | Technical Report                      |
| 13 | 1988 | Geometric Modeling Using Active Sensing—an Overview (with J. K. Aggarwal)                                  | <i>IEEE Control Systems Magazine</i> , Vol. 3, No. 2, pp. 7-13   | Article                               |
| 14 | 1988 | Inference of Object Surface Structure from Structured Lighting—an Overview (with J. K. Aggarwal)           | <i>Machine Vision Algorithms, Architectures, and Systems</i> , edited by Herbert Freeman, Academic Press, San Diego, CA, pp. 193-220 | Book Chapter                          |
| 15 | 1988 | Geometric Modeling Using Both Active and Passive Sensing (with J. K. Aggarwal)                             | <i>Proceedings of the SPIE Sensor Fusion Workshop: Spatial Reasoning and Scene Interpretation</i> , Cambridge, MA, pp. 12-19         | Refereed Conference Proceedings       |
| 16 | 1989 | Design and Implementation of Large Spatial Databases (with A. Buckmann, O. Gunther, and T. R. Smith (eds)) | <i>Lecture Notes in Computer Science 409</i> , Proceedings of the First Symposium SSD, Springer-Verlag, Berlin                       | Book                                  |
| 17 | 1989 | Integration of Active and Passive Sensing Techniques for Representing 3-D Objects (with J. K. Aggarwal)    | <i>IEEE Transactions on Robotics and Automation</i> , Vol. 5, No. 4, pp. 460-471   | Article                               |
| 18 | 1989 | On the Computation of Intrinsic Surface Properties with Structured Lighting                                | <i>Proceedings of the SPIE Conference on Applications of Artificial Intelligence VII</i> , Orlando, Florida, pp. 321-332             | Refereed Conference Proceedings       |
| 19 | 1989 | A New Method for Computing Intrinsic Surface Properties (with P. Liang)                                    | <i>Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition</i> , San Diego, CA, pp. 235-240   | Refereed Conference Proceedings (20%) |
| 20 | 1989 | Interpretation of 3-D Structure and Motion Using Structured Lighting (with Arvind Pandey)                  | <i>Proceedings of the IEEE Workshop on Interpretation of 3-D Scenes</i> , Austin, TX, pp. 84-90                                      | Refereed Workshop Proceedings         |

| #  | YEAR | TITLE and AUTHORS  | PUBLISHER   | CATEGORY                              |
|----|------|--|---|---------------------------------------|
| 21 | 1990 | A New Method for Edge Detection and Localization (with Jeng-Feng Lee and P. Liang)                                       | <i>Proceedings of the SPIE Conference on Applications of Artificial Intelligence VIII</i> , Orlando, Florida, pp. 524-535 | Refereed Conference Proceedings       |
| 22 | 1990 | A Surface Reconstruction Model Using Deformable Templates (with Jih-Fang Wang)   | <i>Proceedings of the SPIE Sensor Fusion Conference III</i> , Boston, MA  | Refereed Conference Proceedings       |
| 23 | 1990 | Surface Reconstruction Using Deformable Models With Interior and Boundary Constraints (with Jih-Fang Wang)               | <i>Proceedings of the third International Conference on Computer Vision</i> , Osaka, Japan, pp. 300-303                   | Refereed Conference Proceedings (20%) |
| 24 | 1991 | Characterizing 3-D Surface Structures from Visual Images   | <i>IEEE Transactions on PAMI</i> , Vol. 13, pp. 52-60   | Article                               |
| 25 | 1991 | Sensor Data Fusion in Robotics Systems (with J. K. Aggarwal)   | <i>Advances in Control and Dynamic Systems</i> , edited by C. T. Leondes, Academic Press, pp. 435-462                     | Book Chapter                          |
| 26 | 1991 | A Study on Using Structured Lighting to Analyze Time Varying Image Sequences (with Arvind Pandey)                        | <i>Pattern Recognition</i> , Vol. 24, No. 8, pp. 723-738  | Article                               |
| 27 | 1991 | Analysis of Video Image Sequences Using Point and Line Correspondences (with Nitin Karandikar and J. K. Aggarwal)        | <i>Pattern Recognition</i> , Vol. 24, No. 11, pp. 1065-1084   | Article                               |
| 28 | 1991 | A Unification Scheme for 3-D Surface Reconstruction Using Physically-Based Models (with Jeng-Feng Lee and Jih-Fang Wang) | <i>International Journal of Imaging Systems and Technology</i> , Vol. 3, pp. 279-299                                      | Article                               |
| 29 | 1991 | Surface Modeling Using Deformable Templates (with Jih-Fang Wang)   | <i>International Journal of Imaging Systems and Technology</i> , Vol. 3, pp. 300-310                                      | Article                               |
| 30 | 1991 | Physically-Based Surface Modeling Using Flexible Wire Frames (with Jih-Fang Wang)  | <i>Proceedings of the Hawaii International Conference on System Science-24</i> , Kailua-Kona, Hawaii, pp. 661-670         | Refereed Conference Proceedings       |

| #  | YEAR | TITLE and AUTHORS  | PUBLISHER   | CATEGORY                        |
|----|------|--|---|---------------------------------|
| 31 | 1991 | A New Method for Sensor Data Fusion in Machine Vision  | <i>Proceedings of the SPIE Conference on Geometric Methods in Computer Vision</i> , San Diego, CA, pp. 31-42  | Refereed Conference Proceedings |
| 32 | 1991 | Fusing Intensity and Structured Lighting for Modeling Cluttered 3-D Scenes (with David I. Cheng)                                     | <i>Proceedings of the IEEE International Conference on Systems, Man &amp; Cybernetics</i> , Charlottesville, Virginia, pp. 825-830                  | Refereed Conference Proceedings |
| 33 | 1991 | An Integrated Approach for 3-D Surface Reconstruction Using Deformable Models (with Jeng-Feng Lee and Jih-Fang Wang)                 | <i>Proceedings of the IEEE International Conference on Systems, Man &amp; Cybernetics</i> , Charlottesville, Virginia, pp. 841-846                  | Refereed Conference Proceedings |
| 34 | 1991 | PIX: A PHIGS Integration into X (with D. L. Huynh, M. Jensen, R. Larsen, J. Southard, Y. Wang, and A. Mangaser)                      | <i>Technical report TR 91-17</i> , Department of Computer Science, University of California, Santa Barbara  | Technical Report                |
| 35 | 1992 | Orientation-Based Unique Representation for Planar Curves and Shapes (with P. Liang and J. F. Lee)                                   | <i>Visual Computer</i> , Vol. 8, pp. 191-199  | Article                         |
| 36 | 1992 | Sensors and Sensor Fusion (with J. K. Aggarwal)  | <i>Encyclopedia of Artificial Intelligence</i> , 2nd edition, edited by Stuart C. Shapiro, John Wiley & Sons, Inc., New York, Vol. 2, pp. 1511-1526 | Book Chapter                    |
| 37 | 1992 | Surface Reconstruction Using Deformable Models With Interior and Boundary Constraints (with Jih-Fang Wang)                           | <i>IEEE Transactions on PAMI</i> . Vol. 14, No. 5, pp. 572-578  | Article                         |
| 38 | 1992 | 3-D Shape Construction and Recognition by Fusing Intensity and Structured Lighting (with David I. Cheng)                             | <i>Pattern Recognition</i> . Vol. 25, No. 12, pp. 1411-1425   | Article                         |
| 39 | 1992 | PIX: An Object-Oriented Network Graphics Environment (with D. L. Huynh, M. Jensen, R. Larsen, J. Southard, Y. Wang, and A. Mangaser) | <i>Proceedings of the CG International 92: Visual Computing — Integrating Computer Graphics with Computer Vision</i> , Tokyo, Japan, pp. 917-936    | Refereed Conference Proceedings |
| 40 | 1992 | On 3D Model Construction by Fusing Heterogeneous Sensor Data (with Z. Yang and J. F. Lee)  | <i>Proceedings of the 1992 IEEE/RSJ International Conference on Intelligent Robots and Systems</i> , Raleigh, NC, pp. 1071-1078                     | Refereed Conference Proceedings |



| #  | YEAR | TITLE and AUTHORS   | PUBLISHER   | CATEGORY                                    |
|----|------|---|---|---|
| 41 | 1993 | PIX: An Object-Oriented Network Graphics Environment (with D. L. Huynh, M. Jensen, R. Larsen, J. Southard, Y. Wang, and A. Mangaser)                    | <i>International Journal of Computers &amp; Graphics</i> . Vol. 17, No. 3, pp. 295-304  | Article                                     |
| 42 | 1994 | On 3D Model Construction by Fusing Heterogeneous Sensor Data (with Jih-Fang Wang)   | <i>CVGIP: Image Understanding</i> . Vol. 60, No. 2, pp. 210-229   | Article                                     |
| 43 | 1994 | A Speech-Directed Multi-Modal Man-Machine Interface for Robotically Enhanced Surgery (with D. R. Uecker, C. Lee, and Yulun Wang)                        | <i>Proceedings of the first International Symposium on Medical Robotics and Computer Assisted Surgery</i> , Pittsburgh, PA, pp. 176-183 | Refereed Conference Proceedings             |
| 44 | 1994 | Image Analysis for Automated Tracking in Robot-Assisted Endoscopic Surgery (with C. Lee, D. R. Uecker, and Yulun Wang)                                  | <i>Proceedings of the 12th International Conference on Pattern Recognition</i> , Jerusalem, Israel, pp. 88-92                           | Refereed Conference Proceedings (oral: 12%) |
| 45 | 1994 | Static Global Scheduling for Optimal Computer Vision and Image Processing Operations on Distributed-Memory Multiprocessors (with C. H. Lee and T. Yang) | <i>Technical Report TRCS 94-23</i> , Department of Computer Science, University of California, Santa Barbara                            | Technical Report                            |
| 46 | 1994 | Learning in Eigenspace: Theory and Application (with B. S. Manjunath and S. Chandrasekaran)   | <i>Technical Report CIPR 94-17</i> , CIPR, University of California, Santa Barbara  | Technical Report                            |
| 47 | 1995 | Static Global Scheduling for Optimal Computer Vision and Image Processing Operations on Distributed-Memory Multiprocessors (with C. H. Lee and T. Yang) | <i>Proceedings of International Conference on Computer Analysis of Images and Patterns</i> , Prague, Czech Republic, pp. 920-925        | Refereed Conference Proceedings             |
| 48 | 1995 | Partitioning and Scheduling for Parallel Image Processing Operations (with C. H. Lee and T. Yang)   | <i>Proceedings of the Seventh IEEE Symposium on Parallel and Distributed Processing</i> , San Antonio, TX, pp. 86-90                    | Refereed Conference Proceedings             |
| 49 | 1995 | An Eigenspace Update Algorithm for Image Analysis (with B. S. Manjunath and S. Chandrasekaran)  | <i>Proceedings of International Symposium on Computer vision</i> , Miami, FL, pp. 551-556   | Refereed Conference Proceedings             |
| 50 | 1996 | Error Analysis of 3D Shape Construction From Structured Lighting (with Z. Yang)   | <i>Pattern Recognition</i> , Vol. 29, No. 2, pp. 189-206  | Article                                     |



| #  | YEAR | TITLE and AUTHORS   | PUBLISHER  | CATEGORY                                    |
|----|------|---|--|---|
| 51 | 1996 | An Eigenspace Update Algorithm for Image Analysis (with S. Chandrasekaran, B. S. Manjunath, J. Winkeler, and H. Zhang)          | <i>Technical Report TRCS 96-04</i> , Department of Computer Science, University of California, Santa Barbara | Technical Report                            |
| 52 | 1996 | Automated Instrument Tracking in Robotically-Assisted Laparoscopic Surgery (with D. R. Uecker, C. Lee, Y. Wang)                 | <i>Journal of Image Guided Surgery</i>   | Article                                     |
| 53 | 1996 | Choreographed Scope Maneuvering in Robotically-Assisted Laparoscopy with Active Vision Guidance (with D. R. Uecker and Y. Wang) | <i>Workshop on Applications of Computer Vision</i> , Saratoga, FL, pp. 187-192                               | Refereed Conference Proceedings (oral: 25%) |
| 54 | 1997 | An Eigenspace Update Algorithm for Image Analysis (with S. Chandrasekaran, B. S. Manjunath, J. Winkeler, and H. Zhang)          | <i>CVGIP: Graphic Models and Image Processing</i> , Vol. 59, No. 5, pp. 321-332                              | Article                                     |
| 55 | 1997 | Global Optimization for Mapping Parallel Image Processing Tasks on Distributed Memory Machines (with C. H. Lee, and Tao Yang)   | <i>Journal of Parallel and Distributed Processing</i> , Vol. 45, pp. 29-45                                   | Article                                     |
| 56 | 1998 | 3D Shape and Motion Analysis from Image Blur and Smear: A Unified Approach (with P. Liang)                                      | <i>International Conference on Computer Vision</i> , Bombay, India, January, pp. 1029-1034                   | Refereed Conference Proceedings (20%)       |
| 57 | 1998 | Local Scale Controlled Anisotropic Diffusion with Local Noise Estimate for Image Smoothing and Edge Detection (with P. Liang)   | <i>International Conference on Computer Vision</i> , Bombay, India, January, 1998, pp. 193-200               | Refereed Conference Proceedings (20%)       |
| 58 | 1998 | A Unified Framework for Image-Derived Invariants (with Ronald-Bryan O. Alferez),  | <i>3rd Asian Conference on Computer Vision</i> , Hong Kong, January, 1998, pp. 400-407                       | Refereed Conference Proceedings             |
| 59 | 1998 | A New Framework for Vision-Enabled and Robotically-Assisted Minimally Invasive Surgery (with D. R. Uecker and Y. Wang)          | <i>Computerized Medical Imaging and Graphics</i> Vol. 22, 1998, pp. 429-437                                  | Article                                     |
| 60 | 1999 | Geometric and Illumination Invariants for Object Recognition (with Ronald Alferez)  | <i>IEEE Transactions on PAMI</i> , Vol. 21, pp. 505-536  | Article                                     |

| #  | YEAR | TITLE and AUTHORS   | PUBLISHER  | CATEGORY                                    |
|----|------|---|--|---|
| 61 | 1999 | Image Indexing and Retrieval Using Image-Derived, Geometrically and Illumination Invariant Features (with Ronald Alferez) | <i>Proceedings of IEEE International Conference on Multimedia Computing and Systems</i> , Florence, Italy, pp. 177-182                                   | Refereed Conference Proceedings             |
| 62 | 1999 | Highly Discriminative Invariant Features for Image Matching (with Ronald Alferez)   | <i>Proceedings of the Third International Conference On Visual Information Systems</i> , Amsterdam, the Netherlands, pp. 435-442                         | Refereed Conference Proceedings             |
| 63 | 1999 | Database Indexing using a Combination of Invariant Shape and Color Descriptions (with Ronald Alferez)                     | <i>Proceedings of the Second International Conference on Information Fusion</i> , Sunnyvale, CA, pp. 688-695   | Refereed Conference Proceedings             |
| 64 | 2000 | VCME: A Visual Interactive Environment for Computational Modeling Systems (with Y. Chen, A. Saran, and T. Smith)          | <i>Encyclopedia of Microcomputers</i> , Vol. 24, 2000, pp. 333-372   | Article                                     |
| 65 | 2001 | Invariant, Intra-Class Retrieval in Homogeneous Databases (with Ronald Alferez)   | <i>Proceedings of International Conference on Multimedia and Expo</i> Tokyo, Japan, pp. 177-182  | Refereed Conference Proceedings             |
| 66 | 2001 | Automated Image Rectification in Video-Endoscopy (with D. Koppel and Hua Lee)   | <i>Proceedings of the International Conference on Medical Image Computing and Computer-Assisted Intervention</i> Utrecht, the Netherlands, pp. 1412-1414 | Refereed Conference Proceedings (23%)       |
| 67 | 2001 | The Use of Bigrams to Enhance Text Categorization (with C. M. Tan and C. D. Lee)  | <i>International Journal of Information Processing &amp; Management</i> , pp. 529-546  | Article                                     |
| 68 | 2001 | A Distributed Protein Visualization Application (with T. Can, Y. J. Wang, and J. Su)                                      | <i>Proceedings of the third International Conference on Bioinformatics</i> , Atlanta, GA   | Software demo                               |
| 69 | 2002 | Improving Text Categorization with High Quality Bigrams, (with Chando Lee and Chade-Meng Tan)                             | <i>The KIPS Transactions: Part B</i> Vol. 9-B, No. 4, 2002, pp. 415-420  | Article                                     |
| 70 | 2002 | Viewing Enhancement in Video-Endoscopy (with D. Koppel and Hua Lee)   | <i>Proceedings of the Workshop on Applications Computer Vision</i> , Orlando, FL, pp. 304-307  | Refereed Conference Proceedings (oral: 25%) |

| #  | YEAR | TITLE and AUTHORS  | PUBLISHER  | CATEGORY                              |
|----|------|--|--|---------------------------------------|
| 71 | 2003 | Fast Protein Visualization using Java3D (with T. Can, Y. Wang, and J. Su)  | <i>Proceedings of the Eighteenth Annual ACM Symposium on Applied Computing</i> , Melbourne, FL, pp. 88-95                        | Refereed Conference Proceedings       |
| 72 | 2003 | Multi-camera Spatio-temporal Fusion and Biased Sequence-data Learning for Security Surveillance (with G. Wu, Y. Wu, L. Jiao and E. Y. Chang) | <i>Proceedings of ACM Multimedia Conference</i> , Berkeley, CA, pp. 528-538  | Refereed Conference Proceedings (17%) |
| 73 | 2003 | Real-Time Multi-person Tracking in Video Surveillance (with K. Wu, J. Long and D. Han)   | <i>Proceedings of the Pacific Rim Multimedia Conference</i> , Singapore, pp. 2C1 1 - 5   | Refereed Conference Proceedings (30%) |
| 74 | 2003 | Invariant Feature Extraction and Biased Statistical Inference for Video Surveillance (with Y. Wu, L. Jiao, G. Wu, and E. Chang)              | <i>Proceedings of the IEEE International Conference on Advanced Video and Signal-based Surveillance</i> , Miami, FL, pp. 284-289 | Refereed Conference Proceedings       |
| 75 | 2003 | Fast Protein Visualization using Java3D, (with T. Can, Y. J. Wang, and J. Su)  | <i>Bioinformatics</i> , Vol. 19, pp. 1-10  | Article                               |
| 76 | 2003 | CTSS: A Robust and Efficient Method for Protein Structure Alignment Based on Local Geometrical and Biological Features (with T. Can)         | <i>Proceedings of the IEEE Computer Society Bioinformatics Conference</i> , Stanford, CA, pp. 169-179                            | Refereed Conference Proceedings (18%) |
| 77 | 2003 | Personalized Annotation and Information Sharing in Protein Science with Information-Slips (with Y. Wang, T. Can, And J. Su)                  | <i>Proceedings of the 2nd International Conference on Information and Knowledge Sharing</i> , Phoenix, AZ, pp. 299-304           | Refereed Conference Proceedings       |
| 78 | 2004 | Image-Based Rendering and Modeling in Video-Endoscopy (with D. Koppel and Hua Lee),  | <i>Proceedings of the International Symposium on Biomedical Imaging</i> , Arlington, VA, pp. 272-279                             | Refereed Conference Proceedings       |
| 79 | 2004 | Toward Real-Time, Physically-Correct Soft Tissue Behavior Simulation, (with Dan Koppel and Shivkumar Chandrasekaren)                         | <i>Proceedings of the International Symposium on Biomedical Imaging</i> , Arlington, VA, pp. 185-188                             | Refereed Conference Proceedings       |
| 80 | 2004 | ProGreSS: Simultaneous Searching of Protein Databases by Sequence and Structure, (with A. Bhattacharya, T. Can, T. Kahveci and A. K. Singh)  | <i>Proceedings of the Pacific Rim Bioinformatics Conference</i> , Hawaii, 2004, pp. 264-275                                      | Refereed Conference Proceedings       |

| #  | YEAR | TITLE and AUTHORS  | PUBLISHER  | CATEGORY                                    |
|----|------|--|--|---|
| 81 | 2004 | Automated Protein Classification Using Consensus Decision, (with T. Can, O. Camouglu and, A. Singh)              | <i>Proceedings of the IEEE Computer Society Bioinformatics Conference</i> , Stanford, CA, pp. 224-235                      | Refereed Conference Proceedings (15%)       |
| 82 | 2004 | Toward Building a Robust and Intelligent Video Surveillance System: A Case Study, (with E. Y. Chang)             | <i>Proceedings of the the IEEE International Conference on Multimedia Systems and Expo</i> , Taipei, Taiwan, pp. 1391-1394 | Refereed Conference Proceedings             |
| 83 | 2004 | The SfinX Video Surveillance System, (with Raju Rangaswami, Zoran Mimitrijevic, Keyle Kakligian and E. Y. Chang) | <i>Proceedings of the IEEE International Conference on Multimedia Systems and Expo</i> , Taipei, Taiwan, pp. 151-160       | Refereed Conference Proceedings             |
| 84 | 2004 | Human Activity Detection and Recognition for Video Surveillance, (with K. Niu, J. Long and D. Han)               | <i>Proceedings of the IEEE International Conference on Multimedia Systems and Expo</i> , Taipei, Taiwan, pp. 719-722       | Refereed Conference Proceedings             |
| 85 | 2004 | Distributed Video Data Fusion and Mining, (with Edward Y. Chang and Volkan Rodoplu)                              | <i>Proceedings of SPIE Defense and Security Symposium</i> , Orland, FL, pp. 222-233  | Refereed Conference Proceedings             |
| 86 | 2004 | Adaptive Stream Resource Management Using Kalman Filter (with Ankur Jain and Edward Chang)                       | <i>Proceedings of the ACM Sigmod Conference</i> , France, pp. 11-22  | Refereed Conference Proceedings (16%)       |
| 87 | 2004 | Protein Structure Alignment and Fast Similarity Search Using Local Shape Signatures, (with T. Can)               | <i>Journal of Bioinformatics and Computational Biology</i> , Vol. 2, No. 1, pp. 215-239                                    | Article                                     |
| 88 | 2005 | The Anatomy of A Multi-Camera Video Surveillance System (with L. Jiao, G. Wu, Y. Wu, and E. Y. Chang)            | <i>ACM Multimedia System Journal</i> , Vol. 10, pp. 144-163  | Article                                     |
| 89 | 2005 | Robust and Real-Time Image Stabilization and Rectification (with D. Koppel and Hua Lee)                          | <i>Proceedings of the Workshop on Applications of Computer Vision</i> , Breckenridge, CO, pp. 350-355                      | Refereed Conference Proceedings (oral: 25%) |
| 90 | 2005 | EXTENT: Inferring Image Metadata from Context and Content (with C.-M. Tsai, A. Qamra, and E. Chang)              | <i>Proceedings of International Conference on Multimedia and Expo</i> , Taipei, Taiwan, pp. 1270-1273                      | Refereed Conference Proceedings             |

| #   | YEAR | TITLE and AUTHORS  | PUBLISHER   | CATEGORY                              |
|-----|------|--|---|---------------------------------------|
| 91  | 2005 | An Affine-Invariant Tool for Retrieving Images from Homogeneous Databases (with Ronald Alferez and L. Jiao)  | <i>Multimedia Tools and Applications</i> , Vol. 25, pp. 133-159   | Article                               |
| 92  | 2005 | Decision Tree Based Information Integration for Automated Protein Classification (with T. Can, O. Camouglu and A. Singh)   | <i>Journal of Bioinformatics and Computational Biology</i> , Vol. 3, June, pp. 717-742,   | Article                               |
| 93  | 2005 | Upper Limb Position Sensing: A Machine Vision Approach (with Dianna Han and Doug Kushner)  | <i>Proceedings of 2nd IEEE EMBS Conference on Neural Engineering</i> , Arlington, VA, pp. 490-493                                 | Refereed Conference Proceedings       |
| 94  | 2005 | A System for Limb Modeling, Position Sensing and Stimulation Control (with Dianna Han and Doug Kushner)  | <i>Proceedings of the 10th Anniversary IFESS Conference</i> , Montreal, Canada, pp. 537-544                                       | Refereed Conference Proceedings       |
| 95  | 2005 | A Video Analysis Framework for Soft Biometry Security Surveillance (with E. Chang and K. P. Cheng)   | <i>Proceedings of the ACM Workshop on Video Surveillance and Sensor Networks</i> , Singapore, pp. 71-78                           | Refereed Conference Proceedings       |
| 96  | 2006 | Using Stationary-Dynamic Camera Assemblies for Wide-area Video Surveillance and Selective Attention (with A. Jain, D. Koppel, and K. Kaligian)                     | <i>Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition</i> , New York, NY, pp. 537-544 | Refereed Conference Proceedings (20%) |
| 97  | 2006 | Identify Color in Motion in Video Sensor (with G. Wu, D. Koppel, K. S. Goh, T. Tsai, K. Kaligian, and A. Jain)   | <i>Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition</i> , New York, NY pp. 561-569  | Refereed Conference Proceedings (20%) |
| 98  | 2006 | Efficient Molecular Surface Generation Using Level-Set Methods (with T. Can and C.-I. Chen)  | <i>Journal of Molecular Graphics and Modeling</i> , Vol. 25, pp. 442-454  | Article                               |
| 99  | 2007 | Bayesian Reasoning for Sensor Group-Queries and Diagnosis (with A. Jain and E. Chang)  | <i>Proceedings of Database Systems for Advanced Applications</i> , ppp. 522-538, Bangkok, Thailand                                | Refereed Conference Proceedings (17%) |
| 100 | 2007 | Toward Automated Model Building from Video in Computer Assisted Diagnoses in Colonoscopy (with D. Koppel, C.-I. Chen, Hua Lee, Jia Gu, A. Poirson, and R. Wolters) | <i>Proceedings of the SPIE Medical Imaging Conference</i> , San Diego, CA, pp. L1-L9.   | Refereed Conference Proceedings       |

| #   | YEAR | TITLE and AUTHORS  | PUBLISHER   | CATEGORY                        |
|-----|------|--|---|---------------------------------|
| 101 | 2008 | Regularizing Optical-Flow Computation using Tensor Theory and Complex Analysis (with D. Koppel and Chang-Ming Tsai)  | <i>Proceedings of CVPR Workshop on Tensors in Image Processing and Computer Vision</i> , Anchorage, AL, pp. 1-6.                          | Refereed Workshop Proceedings   |
| 102 | 2008 | A New Framework for Behavior Modeling of Organs and Soft Tissue using the Boundary-Element Methods (with D. Koppel and Shiv Chandrasekaran)                      | <i>Proceedings of CVPR Workshop on Non-rigid Shape Analysis and Deformable Image Alignment</i> , Anchorage, AL, pp. 1-6.                  | Refereed Workshop Proceedings   |
| 103 | 2008 | Contrast Compensation for Back-lit and Front-lit Color Face Images via Fuzzy Logic Classification and Image Illumination Analysis (with C-M. Tsai and Z.-M. Yeh) | <i>Proceedings of International Conference on Machine Learning and Cybernetics</i> , Taipei, Taiwan, pp. 3563-3568.                       | Refereed Conference Proceedings |
| 104 | 2008 | Stabilizing Stereo Correspondence Computation Using Delaunay Triangulation and Planar Homography (with C.-I. Chen, D. Sargent, C.-M. Tsai and D. Koppel)         | <i>Lecture Notes in Computer Science, 4th International Symposium on Visual Computing (ISCV)</i> , Las Vegas, NV, vol. 5358, pp. 846-855. | Refereed Conference Proceedings |
| 105 | 2009 | Uniscale Multi-view Registration Using Double Dog-Leg Method (with C.-I. Chen, D. Sargent, C.-M. Tsai and D. Koppel)   | <i>Proceedings of the SPIE Medical Imaging Conference</i> , San Diego, CA.  | Refereed Conference Proceedings |
| 106 | 2009 | Feature Detector and Descriptor for Medical Images (with C.-I. Chen, D. Sargent, C.-M. Tsai, and D. Koppel)  | <i>Proceedings of the SPIE Medical Imaging Conference</i> , San Diego, CA.  | Refereed Conference Proceedings |
| 107 | 2009 | Smoke Detection in Video (with D. K. Kim)  | <i>World Congress on Computer Science and Information Engineering</i> , Los Angeles, CA, pp.759-763.                                      | Refereed Conference Proceedings |
| 108 | 2009 | Decision Tree-Based Contrast Enhancement for Various Color Images (with C-M. Tsai and Z.-M. Yeh)   | <i>Machine Vision and Applications</i> , Sep. 2009  | Article                         |
| 109 | 2010 | Modeling Tumor/Polyp/Lesion Structure in 3D for Computer-Aided Diagnosis in Colonoscopy (with C.-I. Chen and D. Sargent)   | <i>Proceedings of the SPIE Medical Imaging Conference</i> , San Diego, CA.  | Refereed Conference Proceedings |
| 110 | 2010 | Cross Modality Registration of Video and Magnetic Tracker Data for 3D Appearance and Structure Modeling (with D. Sargent and C.-I. Chen)                         | <i>Proceedings of the SPIE Medical Imaging Conference</i> , San Diego, CA.  | Refereed Conference Proceedings |

| #   | YEAR | TITLE and AUTHORS  | PUBLISHER   | CATEGORY                        |
|-----|------|--|---|---------------------------------|
| 111 | 2006 | Robust Perceptual Color Identification (with K.S. oh, and E. Chang)  | <i>US Patent 7,136,524</i>  | Patent                          |
| 112 | 2011 | Multi-View Stereo Point Clouds Visualization (with Yi Gong)  | <i>Proceedings of International Symposium on Visual Computing, Lake Tahoe, CA.</i>  | Refereed Conference Proceedings |
| 113 | 2011 | Adaptive multi-modal integrated biometric identification detection and surveillance systems (with E. Chang and K. Cheng)                                       | <i>US Patent 7,956,890</i>  | Patent                          |
| 114 | 2011 | PhotoModel3D: A Photo- and Video-based 3D Modeling Tool  | <a href="http://rogue.cs.ucsb.edu/PhotoModel3D/webUpload.html">http://rogue.cs.ucsb.edu/PhotoModel3D/webUpload.html</a> , | Public Software Release         |
| 115 | 2011 | PhotoNav3D: A Spatially-Aware Photo Browsing Tool  | <a href="http://rogue.cs.ucsb.edu/PhotoNav3D/webUpload.html">http://rogue.cs.ucsb.edu/PhotoNav3D/webUpload.html</a> ,     | Public Software Release         |
| 116 | 2011 | Mosaic3D: A Panoramic Image Stitching Tool   | <a href="http://rogue.cs.ucsb.edu/Mosaic3D/webUpload.html">http://rogue.cs.ucsb.edu/Mosaic3D/webUpload.html</a> ,         | Public Software Release         |
| 117 | 2013 | Front Vehicle Blind Spot Translucitization Based on Augmented Reality (with Che-Tsung Lin, Yu-Chen Lin, and Long-Tai Chen)                                     | <i>Proceedings of IEEE Vehicular Technology Conference, Las Vegas, CA.</i>  | Refereed Conference Proceedings |
| 118 | 2014 | Enhancing Vehicular Safety in Adverse Weather using Computer Vision Analysis (with Che-Tsung Lin, Yu-Chen Lin, and Long-Tai Chen)                              | <i>Proceedings of the 80th IEEE Vehicular Technology Conference, Vancouver, Canada.</i>                                   | Refereed Conference Proceedings |
| 119 | 2014 | Photo- and Video-based Ranging and Modeling  | <i>International Telemetering Conference, San Diego, CA.</i>  | Refereed Conference Proceedings |
| 120 | 2015 | Learning a Mahalanobis Distance-Based Dynamic Time Warping Measure for Multivariate Time Series Classification (with Jiangyuan Mei, Meizhu Liu, and Jujun Gao) | <i>IEEE Transactions on Cybernetics</i> , May 2015  | Article                         |



| #   | YEAR | TITLE and AUTHORS   | PUBLISHER   | CATEGORY                                     |
|-----|------|---|---|--|
| 121 | 2015 | Evaluation, Design and Application of Object Tracking Technologies for Vehicular Technology Applications (with Che-Tsung Lin and Long-Tai Chen) | <i>Proceedings of the 81st IEEE Vehicular Technology Conference</i> , Boston, MA.   | Refereed Conference Proceedings              |
| 122 | 2015 | Computer Vision Analysis for Vehicular Safety Applications  | <i>International Telemetering Conference</i> , Las Vegas, CA.   | Refereed Conference Proceedings              |
| 123 | 2016 | Robust and Efficient Tracking with Large Lens Distortion for Vehicular Technology Applications (with Che-Tsung Lin and Long-Tai Chen)           | <i>Proceedings of the 83rd IEEE Vehicular Technology Conference</i> , Montreal, Canada.   | Refereed Conference Proceedings              |
| 124 | 2017 | Virtual Dictionary based Kernel Sparse Representation for Face Recognition (with Zizhu Fan, Da Zhang, xing Wang and Qi Zhu)                     | <i>Pattern Recognition</i> , Oct, 2017  | Article                                      |
| 125 | 2017 | Detail Enhancement of Image Super-Resolution based on Detail Synthesis (with Jinsheng Xiao, Hong Tian and Yuli Kuang)                           | <i>Signal Processing: Image Communication</i> , Vol. 50, pp 2-33.   | Article                                      |
| 126 | 2017 | Multimodel Transfer: A hierarchical Deep Convolutional Network for Fast Artistic Style Transfer (with X. Wang G. Oxholm and D. Zhang),          | <i>IEEE CVPR Conference</i> , Hawaii, August  | Refereed Conference Proceedings (15%)        |
| 127 | 2017 | Deep Reinforcement Learning for Visual Object Tracking in Videos (with Da Zhang, Hamid Maei, and Xin Wang)                                      | <i>arXiv preprint arXiv:1701.08936</i> , 2017   | Preprint                                     |
| 128 | 2018 | Video Captioning via Hierarchical Reinforcement Learning (with Xin Wang, Wenhui Chen, Jiawei Wu and William Wang)                               | <i>IEEE CVPR Conference</i> , Utah, June  | Refereed Conference Proceedings (15%)        |
| 129 | 2018 | Watch, Listen, and Describe: Globally and Locally Aligned Cross-Modal Attentions for Video Captioning (with Xin Wang and William Wang)          | <i>North American Chapter of the Association for Computational Linguistics: Human Language Technologies</i> , New Orleans, LA, June | Refereed Conference Proceedings              |
| 130 | 2018 | S3D: Single Shot multi-Span Detector via Fully 3D Convolutional Network (with Da Zhang, Xiyang Dai and Xin Wang)                                | <i>British Machine Vision Conference</i> , England, September   | Refereed Conference Proceedings (oral, 4.3%) |



| #   | YEAR | TITLE and AUTHORS <sup>a</sup>   | PUBLISHER  | CATEGORY <sup>b</sup>                 |
|-----|------|--|--|---------------------------------------|
| 131 | 2018 | Video Denoising Algorithm Based on Improved Dual-domain Filtering and 3D Block Matching (with Jinsheng Xiao, W. Zhou, S. Zhang J. Lei, and W. Wang)  | <i>IET Image Processing</i> , Vol. 12, pp 2250-2257  | Article                               |
| 132 | 2016 | Robust and Efficient Tracking with Large Lens Distortion for Vehicular Technology Applications for Vehicular Technology Applications (with Che-Tsung Lin, Way Chen and Long-Tai Chen) <a href="#">web link</a> | <i>Proceedings of IEEE Vehicular Technology Conference</i> , September 2016, Montreal, Canada. | Refereed Conference Proceedings       |
| 133 | 2017 | Detail Enhancement of Image Super-Resolution based on Detail Synthesis (with J. Xiao, E. Liu, L. Zhao, and W. Jiang) <a href="#">web link</a>  | <i>Signal Processing: Image Communication</i> , Vol. 50, February, 2017, pp. 2-33.             | Journal Article                       |
| 134 | 2017 | Multimodel Transfer: A Hierarchical Deep Convolutional Network for Fast Artistic Style Transfer (with X. Wang, G. Oxholm, and D. Zhang) <a href="#">web link</a>   | IEEE CVPR Conference, Hawaii, August 2017.   | Refereed Conference Proceedings (20%) |
| 135 | 2017 | Deep Reinforcement Learning for Visual Object Tracking in Videos (with D. Zhang, H. Maei, and X. Wang) <a href="#">web link</a>  | UCSB Technical Report, July 2017.  | Technical Report                      |
| 136 | 2018 | Virtual Dictionary based Kernel Sparse Representation for Face Recognition (with Z. Fan, D. Zhang, and Q. Zhu) <a href="#">web link</a>  | <i>Journal of Pattern Recognition</i> , Vol. 76, 2018, pp. 1-13.                               | Journal Article                       |
| 137 | 2018 | Video Captioning via Hierarchical Reinforcement Learning (with X. Wang, W. Chen J. Wu, and William Wang) <a href="#">web link</a>  | IEEE CVPR Conference, Salt Lake City, Utah, June 2018.   | Refereed Conference Proceedings (20%) |

<sup>a</sup>Item numbers in red are clickable web links

<sup>b</sup>Highly competitive conference acceptance rates and honor of oral presentation, if known, are included

| #                   | YEAR | TITLE and AUTHORS <sup>a</sup>  | PUBLISHER   | CATEGORY <sup>b</sup>   |
|---------------------|------|---|---|---|
| <a href="#">138</a> | 2018 | Watch, Listen and Describe: Globally and Locally Aligned Cross-Model Attention for Video Captioning (with X. Wang and William Wang) <a href="#">web link</a>  | North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-HLT), New Orleans, LA, June 2018. | Refereed Conference Proceedings                                   |
| <a href="#">139</a> | 2018 | No Metrics Are Perfect: Adversarial Reward Learning for Visual StoryTelling (with X. Wang, W. Chen, and William Wang) <a href="#">web link</a>  | 56th Annual Meeting of the Association for Computational Linguistics (ACL), Melbourne, Australia, June 2018.                                  | Refereed Conference Proceedings (Oral Presentation, 20%)          |
| <a href="#">140</a> | 2018 | S3D: Single Shot multi-Span Detector via Fully 3D Convolutional Network (with Da Zhang, Xiyang Dai and Xin Wang) <a href="#">web link</a>   | British Machine Vision Conference (BMVC) Newcastle, England, September 2018.  | Refereed Conference Proceedings (Oral Presentation, 4.3%)         |
| <a href="#">141</a> | 2018 | Dynamic Temporal Pyramid Network: A Closer Look at Multi-Scale Modeling for Activity Detection (with Da Zhang and Xiyang Dai) <a href="#">web link</a>  | ACCV, Perth, Australia, December 2018.  | Refereed Conference Proceedings (Oral Presentation, 4.5%)         |
| <a href="#">142</a> | 2019 | MAN: Moment Alignment Network for Natural Language Moment Retrieval via Iterative Graph Adjustment (with Da Zhang, Xiyang Dai, Xin Wang, and Larry Davis) <a href="#">web link</a>  | IEEE CVPR Conference, Long Beach, June, 2019.   | Refereed Conference Proceedings (20%)                             |
| <a href="#">143</a> | 2019 | Reinforced Cross-Modal Matching and Self-Supervised Imitation Learning for Vision-Language Navigation (with Xin Wang, Qiuyuan Huang, Asli Celikyilmaz, Jianfeng Gao, Dinghan Shen, William Yang Wang, and Lei Zhang) <a href="#">web link</a> | IEEE CVPR Conference, Long Beach, June, 2019.   | Refereed Conference Proceedings (Best Student Paper Award, 0.01%) |

<sup>a</sup>Item numbers in red are clickable web links

<sup>b</sup>Highly competitive conference acceptance rates and honor of oral presentation, if known, are included

| #   | YEAR | TITLE and AUTHORS <sup>a</sup>   | PUBLISHER  | CATEGORY <sup>b</sup>                                     |
|-----|------|--|--|---|
| 144 | 2019 | VaTex: a Large-Scale, High-Quality Multilingual Dataset for Video-and-language Research (with Xin Wang, Jiawei Wu, Junkun Chen, Lei Li, and William Yang Wang) <a href="#">web link</a>  | International Conference on Computer Vision, Souel, Korea, November, 2019. | Refereed Conference Proceedings (Oral presentation, 4.5%) |
| 145 | 2020 | Vision-Language Navigation Policy Learning and Adaptation (with Xin Wang, Qiuyuan Huang, Asli Celikyilmaz, Jianfeng Gao, Dinghan Shen, William Yang Wang, and Lei Zhang) <a href="#">web link</a>                              | IEEE Transactions on PAMI, 2020  | Article   |
| 146 | 2020 | METAL: Minimum Effort Temporal Activity Localization in Untrimmed Videos (with Da Zhang and Xiyang Dai) <a href="#">web link</a>   | IEEE CVPR Conference, Seattle, WA 2020                                     | Referred Conference Proceedings (Oral presentation, 4%)   |
| 147 | 2020 | Towards Effective and Efficient Temporal Activity Detection (with Da Zhang, Xiyang Dai, and Xin Wang) <a href="#">web link</a>   | submitted for publication in International Journal of Computer Vision      | Article   |
| 148 | 2022 | Generative adversarial network with hybrid attention and compromised normalization for multi-scene image conversion (with Jinsheng Xiao, Shuhao Zhang, Yuntao Yao, ZhongYuan Wang and Yongqin Zhang ) <a href="#">web link</a> | <i>Neural Computing and Applications</i> , 2022                            | Article   |
| 149 | 2022 | VERN: VolleyBall Rally Dataset with Expression Notation Language (with Haotain Xia, Rhys Tracy, Erwan Fraisse, and Linda Petzold) <a href="#">web link</a>   | <i>IEEE International Conference on Knowledge Graphs</i> , Oct 2022        | Refereed Conference Proceedings                           |
| 150 | 2023 | FDLR-Net: A Feature Decoupling and Localization Refinement Network for object detection in Remote Sensing Images (with Jinsheng Xiao, Yuntao Yao; Jian Zhou, Haowen Guo and Qiuze Yu) <a href="#">web link</a>                 | <i>Expert Systems with Applications</i>                                    | Article   |

<sup>a</sup>Item numbers in red are clickable web links<sup>b</sup>Highly competitive conference acceptance rates and honor of oral presentation, if known, are included

| #   | YEAR | TITLE and AUTHORS <sup>a</sup>   | PUBLISHER  | CATEGORY <sup>b</sup>           |
|-----|------|--|--|---------------------------------|
| 151 | 2023 | RallyGraph: Specialized Graph Encoding for Enhanced Volleyball Prediction (with Rhys Tracy, Haotian Xia, Alex Rasla, and Ambuj Singh) <a href="#">web link</a>   | <i>KDD Workshop on Data Science and AI for Sports (DSAI4Sports)</i> , June 2023              | Refereed Conference Proceedings |
| 152 | 2023 | Advanced Volleyball Stats for All Levels: Automatic Setting Tactic Detection and Classification with a Single Camera (with Haotian Xia, Rhys Tracy, Yun Zhao, Yuqing Wang and Weining Shen) <a href="#">web link</a> | Workshop in International Conference on Data Mining (ICDM)                                   | Refereed Conference Proceedings |
| 153 | 2024 | SportsQA: A Benchmark on Sports Understanding in Large Language Models (with Haotian Xia, <i>et. al</i> ),   | submitted for publication in North American Association of Computational Linguistics (NNACL) | Refereed Conference Proceedings |

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<sup>a</sup>Item numbers in red are clickable web links

<sup>b</sup>Highly competitive conference acceptance rates and honor of oral presentation, if known, are included