

Hamed Sari-Sarraf, Ph.D., P.E.

AREAS OF EXPERTISE

Image processing and pattern recognition methodologies for the design and realization of novel computer/machine vision systems in industrial, agricultural, and medical applications

EDUCATION

Ph.D. in Electrical Engineering	The University of Tennessee, Knoxville	1993
M.S. in Electrical Engineering	The University of Tennessee, Knoxville	1986
B.S. in Electrical Engineering (With Honors)	The University of Tennessee, Knoxville	1984

PROFESSIONAL APPOINTMENTS

Professor	Texas Tech University, Elec. & Comp. Eng. Department	Sep '11 – Present
Associate Chair for Computer Eng.	Texas Tech University, Elec. & Comp. Eng. Department	Nov '09 – Dec '11
Erasmus Mundus Scholar	University of Burgundy, Le Creusot, France Electronic, Information, and Imaging Laboratory	Sep '08 – Dec '08
Associate Professor	Texas Tech University, Elec. & Comp. Eng. Department	Sep '03 – Aug '11
Assistant Professor	Texas Tech University, Elec. & Comp. Eng. Department	Sep '99 – Aug '03
Adjunct Professor	The University of Tennessee, Knoxville Elec. & Comp. Eng. Department	1994 – 2001
R&D Staff Member II	Oak Ridge National Laboratory, Instrumentation & Controls Division	Jan '99 – Aug '99
R&D Staff Member I	Oak Ridge National Laboratory, Instrumentation & Controls Division	1994 – 1999
Post-Doctoral Associate	Oak Ridge National Laboratory, Instrumentation & Controls Division	1993 – 1994
Design Engineer	Digital A.V., Knoxville, TN	1986 – 1987

TEACHING

- Texas Tech University (TTU), September 1999 - Present
 - Advanced Segmentation Algorithms (EE 5332) – Developed the course
 - Engineering Analysis (EE 5371) – completely revised the course
 - Image Processing (EE4367/EE5367) - revised the course
 - Pattern Recognition (EE4331/EE6363) - revised the course
 - Principles of Communication Systems (EE3323)

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- Linear Systems (EE3303) – First instructor to teach the newly revamped course
 - Introduction to Computer Programming (EE1305) – helped to revamp the course
 - Introduction to Electrical Engineering (EE1304) – helped to develop the course
 - Faculty Advisor for Project Labs IV, and V
- The University of Tennessee, Knoxville (UTK), August 1993 – May 1999
- Introductory and advanced courses in image processing and pattern recognition

RESEARCH CONTRACTS & GRANTS

- Since start of appointment at Texas Tech University, my research has generated over \$3.5M in funding, of which ~\$2M is attributed to me directly. Sources of funding include federal (e.g., National Library of Medicine), state (e.g., Texas Higher Education Coordinating Board), and private (e.g., Cotton Incorporated) agencies.

REFEREED JOURNAL PUBLICATIONS (Past 10 Years – Total of 24)

1. M. Shahriar, H. Sari-Sarraf, and E. F. Hequet, "A Machine Vision System to Estimate Cotton Fiber Maturity from Longitudinal View Using a Transfer Learning Approach," *Machine Vision and Applications*, Under Review.
2. A. Gururajan, H. Sari-Sarraf, and E. F. Hequet, "IT-SNAPS: A Framework for a User-Aware Interactive Texture Segmentation system," *Journal of Electronic Imaging*, accepted.
3. C. Mao, A. Gururajan, H. Sari-Sarraf, and E. F. Hequet, "Machine Vision Scheme for Stain Release Evaluation Using Gabor Filters with Optimized Coefficients," *Machine Vision and Applications*, Vol. 23, No. 2, p. 349-361, 2012.
4. M. Hill, S. Kamalakannan, A. Gururajan, H. Sari-Sarraf, and E. F. Hequet, "Dimensional Change Measurement and Stain Segmentation in Printed Fabrics," *Textile Research Journal*, Vol. 81, No. 16, p. 1655-1672, 2011.
5. A. Gururajan, S. Kamalakannan, H. Sari-Sarraf, M. Shahriar, R. Long, and S. Antani, "On the Creation of a Segmentation Library for Digitized Cervical and Lumbar Spine Radiographs," *Computerized Medical Imaging and Graphics*, Vol. 35, No. 4, p. 251-265, 2011.
6. S. Kamalakannan, A. Gururajan, M. Hill, M. Shahriar, H. Sari-Sarraf, and E. Hequet, "GPU-Based Machine Vision System for Simultaneous Measurement of Shrinkage and Soil Release in Fabrics," *Journal of Electronic Imaging*, Vol. 19, No. 2, 023009, 2010.
7. S. Kamalakannan, A. Gururajan, H. Sari-Sarraf, R. Long, and S. Antani, "Double Edge Detection of Radiologic Lumbar Vertebrae Using Pressurized Open DGVF Snakes," *IEEE Trans. on Biomedical Eng.*, Vol. 57, No. 6, p. 1325-1334, 2010.
8. A. Gururajan, H. Sari-Sarraf, and E. F. Hequet, "A Statistical Approach to Unsupervised Defect Detection and Multi-Scale Localization in Two-Texture Images," *Optical Engineering*, Vol. 47, No. 2, 027202, 2008.
9. A. Gururajan, E. F. Hequet, and H. Sari-Sarraf, "Objective Evaluation of Soil Release in Fabrics," *Textile Research Journal*, Vol. 78, No. 9, p. 782-795, 2008.
10. H. Wang, C. Mao, H. Sari-Sarraf, and E. F. Hequet, "Accurate Length Measurement of Multiple Cotton Fibers," *Journal of Electronic Imaging*, Vol. 17, No. 3, 031110, 2008.
11. N. Abidi, E. F. Hequet, C. N. Turner, and H. Sari-Sarraf, "FTIR Analysis of Cross-linked Cotton Fabric Using a ZnSe- Universal Attenuated Total Reflectance," *Journal of Applied Polymer Science*, Vol. 96, No. 2, p. 392-399, 2005.

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12. N. Abidi, C. N. Turner, E. F. Hequet, and H. Sari-Sarraf, "Objective Evaluation of Durable Press Treatment and Fabric Smoothness Rating," *Textile Research Journal*, Vol. 75, No. 1, p. 19-29, 2005.
13. H. Y. Chan, H. Sari-Sarraf, B. Grinstead, and S. S. Gleason, "Content-Based Compression of Mammograms with Customized Fractal Encoding and a Modified JPEG2000," *Optical Engineering*, Vol. 43, No. 12, p. 2986-2993, 2004.
14. C. N. Turner, H. Sari-Sarraf, E. F. Hequet, N. Abidi, and S. H. Lee, "Preliminary Validation of a Fabric Smoothness Assessment System," *Journal of Electronic Imaging*, Vol. 13, No. 3, p. 418-427, 2004.
15. A. Pai, H. Sari-Sarraf, and E. F. Hequet, "Recognition of Cotton Contaminants via X-ray Microtomographic Image Analysis," *IEEE Trans. on Industry Applications*, Vol. 40, No. 1, p. 77-85, 2004.
16. S. S. Gleason, H. Sari-Sarraf, M. Abidi, O. Karakashian, and F. Morandi "A New Deformable Model for Analysis of X-ray CT Images in Pre-clinical Studies of Mice for Polycystic Kidney Disease," *IEEE Trans. on Medical Imaging*, Vol. 21, No. 10, p. 1302-1309, 2002.
17. H. Sari-Sarraf, E. F. Hequet, N. Abidi, Y. Dai, and H. Y. Chan, "Automatic Measurement of Fabric Shrinkage," *AATCC Review*, Vol. 2, No. 10, p. 20-23, 2002.

REFEREED CONFERENCE PUBLICATIONS (Past 10 Years – Total of 63)

1. M. Shahriar, H. Sari-Sarraf, and E. Hequet, "Feature-Based Transfer Learning to Train a Novel Cotton Imaging System," *Proc. IEEE 10th SSIAl*, Santa Fe, NM, April 2012.
2. S. S. Gleason, M. Dema, H. Sari-Sarraf, A. Cheriyyadat, R. Vatsavai, and R. Ferrell, "Verification and Validation of a Semantic Image Tagging Framework via Generation of Geospatial Imagery Ground Truth," *Proc. IEEE IGARSS*, Vancouver, Canada, July 2011. **(Invited)**
3. M. Shahriar, I. Scott-Fleming, H. Sari-Sarraf, and E. Hequet, "Training a New Cotton Imaging System via a Transfer Learning Approach," *WORLDCOMP '11, Proc. IPCV*, Las Vegas, Nevada, July 2011.
4. A. Gururajan, H. Sari-Sarraf, and E. F. Hequet, "Interactive Texture Segmentation via IT-SNAPS," *Proc. IEEE 9th SSIAl*, Austin, TX, May 2010.
5. S. Kamalakannan, A. Gururajan, M. Shahriar, M. Hill, J. Anderson, H. Sari-Sarraf, and E. Hequet, "Assessing Fabric Stain Release with a GPU Implementation of Statistical Snakes," *Proc. SPIE*, San Jose, CA, January 2009.
6. A. Gururajan, S. Kamalakannan, M. Shahriar, and H. Sari-Sarraf, "Analysis Tool for Digitized Cervical and Lumbar Vertebrae Images," *Proc. IEEE 8th SSIAl*, Santa Fe, NM, March 2008.
7. H. Wang, C. Mao, H. Sari-Sarraf, and E. F. Hequet, "Accurate Length Measurement of Multiple Cotton Fibers," *Proc. 8th QCAV*, Le Creusot, France, May 2007.
8. A. Gururajan, H. Sari-Sarraf, and E. F. Hequet, "Statistical Modeling, Detection and Segmentation of Stains in Digitized Fabric Images," *Proc. SPIE*, Vol. 6503, San Jose, CA, January 2007.
9. J. Rasty, and H. Sari-Sarraf, "Application of X-Ray Tomography, Light and Scanning Electron Microscopy to Failure Analysis of a Fill-Valve Coupling Nut," *2nd International Conf. on Engineering Failure Analysis*, Toronto, Canada, September 2006.
10. H. Y. Chan, C. Raju, H. Sari-Sarraf, and E. F. Hequet, "A General Approach to Defect Detection in Textured Materials Using a Wavelet Domain Model and Level Sets," *Proc. SPIE*, Vol. 6001, p. 102-107, Boston, MA, October 2005. **(Invited)**

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11. C. N. Turner, H. Y. Chan, H. Sari-Sarraf, and E. F. Hequet, "Fabric Smoothness Evaluation Using the Wavelet Domain Independent Mixture Model and a Landform Classification Technique," *Proc. SPIE*, Vol. 5679, p. 86-98, San Jose, CA, January 2005.
12. M. S. Dogan, H. Sari-Sarraf, and E. F. Hequet, "Cotton Trash Assessment in Radiographic X-ray Images with Scale-Space Filtering and Stereo Analysis," *Proc. SPIE*, Vol. 5679, p. 276-287, San Jose, CA, January 2005.
13. N. Abidi, E. Hequet, C. Turner, and H. Sarraf, "FTIR Analysis of Cross-linked Cotton Fabric Using a ZnSe-Universal Attenuated Total reflectance," *American Chemical Society, Southwest Regional Meeting*, Dallas, TX, September 2004.
14. B. Howe, A. Gururajan, H. Sari-Sarraf, and R. Long, "Hierarchical Segmentation of Cervical and Lumbar Vertebrae Using a Customized Generalized Hough Transform and Extensions to Active Appearance Models," *Proc. IEEE 6th SSIAl*, p. 182-186, Lake Tahoe, NV, March 2004.
15. S. K. Pavani, M. S. Dogan, H. Sari-Sarraf, and E. F. Hequet, "Segmentation and Classification of Four Common Cotton Contaminants in X-Ray Microtomographic Images," *Proc. SPIE*, Vol. 5303, p. 1-13, San Jose, CA, January 2004.
16. C. N. Turner, H. Sari-Sarraf, E. F. Hequet, and S. H. Lee, "Preliminary Validation of a Fabric Smoothness Assessment System," *Proc. 6th QCAV*, Vol. 5132, p. 140-148, Gatlinburg, TN, May 2003. **(Best Student Paper Award)**
17. G. Zamora, H. Sari-Sarraf, and R. Long, "Hierarchical Segmentation of Vertebrae from X-ray Images," *Proc. SPIE Medical Imaging*, Vol. 5032, p. 631-642, San Diego, CA, February 2003.
18. A. Pai, H. Sari-Sarraf, and E. F. Hequet, "Recognition of Cotton Contaminants via X-ray Microtomographic Image Analysis," *Proc. IEEE 37th IAS Meeting*, Vol. 1, p. 312-319, Pittsburgh, PA, October 2002.
19. C. N. Turner, H. Sari-Sarraf, A. Zhu, E. F. Hequet, and S. H. Lee, "Automatic Assessment of Fabric Smoothness," *Proc. IEEE 45th MWSCAS*, Vol. 2, p. 379-382, Tulsa, OK, August 2002. **(Invited)**
20. S. S. Gleason, M. A. Abidi, and H. Sari-Sarraf, "Probabilistic Shape and Appearance Model for Scene Segmentation," *Proc. IEEE ICRA*, Vol. 3, p. 2982-2987, Washington D.C., May 2002.
21. M. M. Dickens, S. S. Gleason, and H. Sari-Sarraf, "Volumetric Segmentation via 3-D Active Shape Models," *Proc. IEEE 5th SSIAl*, p. 248-252, Santa Fe, NM, April 2002.
22. A. Tezmol, H. Sari-Sarraf, S. Mitra, R. Long, and A. Gururajan, "Customized Hough Transform for Robust Segmentation of Cervical Vertebrae from X-Ray Images," *Proc. IEEE 5th SSIAl*, p. 224-228, Santa Fe, NM, April 2002.
23. G. Zamora, H. Sari-Sarraf, S. Mitra, and R. Long, "Analysis of Feasibility of using Active Shape Models for Segmentation of Gray Scale Images," *Proc. SPIE Medical Imaging*, Vol. 4684 III, p. 1370-1381, San Diego, CA, February 2002.
24. H. Sari-Sarraf, E. F. Hequet, N. Abidi, Y. Dai, and H. Y. Chan, M. R. Jasso, and B. Morris, "Image Processing Algorithm for Automatic Assessment of Fabric Shrinkage," *Proc. SPIE*, Vol. 4664, p. 89-96, San Jose, CA, January 2002.

PUBLICATIONS – Notes

- Co-authors on every journal and all but one conference publication are either my students or colleagues whose areas of expertise are vastly different from mine.
- As of 06/28/2012, my publications have produced 272 citations with an h-index of 9. This excludes self citations of all authors. Source: www.scopus.com.

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PATENTS

1. H. Sari-Sarraf, E. F. Hequet, C. N. Turner, H. Y. Chan, and A. Zhu, "Fabric Wrinkle Evaluation," 7,601,978, October 2009.
2. S. S. Gleason and H. Sari-Sarraf, "Method for Non-referential Defect Characterization Using Fractal Encoding and Active Contours," 7,218,772, May 2007.
3. H. Sari-Sarraf, E. F. Hequet, and A. Pai, "Method for Identification of Cotton Contaminants with X-ray Microtomographic Image Analysis," 6,870,897, March 2005.
4. H. Sari-Sarraf and J. S. Goddard, "4-D Characterization of a Sheet-Forming Web," No. 6,553,133, April 2003.
5. S. S. Gleason, M. A. Hunt, and H. Sari-Sarraf, "Context-Based Automated Defect Classification System Using Multiple Morphological Masks," No. 6,456,899, September 2002.
6. M. J. Paulus, H. Sari-Sarraf, K. W. Tobin, S. S. Gleason, and C. E. Thomas, "Ultra-High Resolution Computed Tomography Imaging," No. 6,421,409, July 2002.
7. M. J. Paulus, H. Sari-Sarraf, M. L. Simpson, and C. L. Britton, Jr., "Simultaneous CT and SPECT Tomography Using CZT Detectors," No. 6,399,951, June 2002.
8. K. W. Tobin, S. S. Gleason, T. P. Karnowski, and H. Sari-Sarraf, "Automated, Defect Spatial Signature Analysis for Semiconductor Manufacturing Process Improvement," No. 5,982,920, November 1999.

GRADUATE DEGREE PRODUCTION

- Since start of appointment at Texas Tech University, I have graduated 4 Ph.D. and 20 M.S. students. Currently, I supervise 5 Ph.D. students.

AWARDS, HONORS & LICENSES

1. Most Influential Faculty Member, Whitacre College of Engineering, TTU, 2011, 2012
2. Abell-Hanger Faculty Award, Texas Tech University, 2010
3. Whitacre Engineering Research Award, Texas Tech University, 2009
4. Halliburton Teaching Excellence Award, Texas Tech University, 2008
5. President's Excellence in Teaching Award, Texas Tech University, 2004
6. Tau Beta Pi Outstanding Professor Award, Texas Tech University, 2001
7. Ex-Students Association's New Faculty Award, Texas Tech University, 2000-2001
8. Technical Achievement Award for the extraordinary development of a novel 3-D imaging system, Oak Ridge National Laboratory, 1999
9. Life Sciences Division Teamwork Award for exemplary performance in the Functional Genomics Initiative research project, Oak Ridge National Laboratory, 1998
10. Significant Event Award for contributions to the success of the Cooperative Research and Development Agreement program with KLA Instruments, Oak Ridge National Laboratory, 1995

EXTRAMURAL & INTRAMURAL SERVICE

- Associate Editor, SPIE Journal of Electronic Imaging, since 2002
- Member of organizing and technical committees of a number of [regional](#), [national](#), and [international](#) conferences.
- Manuscript reviewer for a number of journals and conferences.
- Member or Chair of numerous university, college, and departmental committees, including

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→ Faculty Development Leave Committee (2011); Center for Undergraduate Research (2009); Graduate Council (2009 – 2011); Chair of the Curriculum Development Committee for Computer Engineering (2009 – 2010). Chair of the Graduate Studies Committee for Admissions (2003 – 2008)

INVITED TALKS (Past 5 Years)

1. "Machine Vision and its Application to Fabric Stain Detection," Church & Dwight Co., April 2012.
2. Formal request by Prof. J. Marti of the University of Girona, Spain, to join his department as an Invited Professor for a period of one month under a funded program. Unable to participate due to time constraints.
3. "Machine Vision: Tomorrow's Challenges," University of Burgundy, Le Creusot, France, December 2008.
4. "Computer Vision Applications in Industry and Medicine," SRM University, Chennai, India, August 2008.
5. "Robust Quality Measurements: Looking to Medical Imaging for Inspiration," EFS System Conference, Memphis, TN, June 2008.
6. "Objective Evaluation of Fabric Soil Release," American Association of Textile Chemists and Colorists, Research Triangle Park, NC, May 2008.