

SHAUN S. GLEASON, PH.D.

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PROFESSIONAL PROFILE

Dr. Shaun S. Gleason is currently the Director of the Computational Sciences and Engineering Division at the Oak Ridge National Laboratory (ORNL), and is responsible for a \$50M R&D portfolio focused on data science for national security, energy, and biology/health challenges. Previously he was the Director of the Office of Institutional Planning at ORNL and was responsible for ORNL's strategic science planning process and internal R&D investment. He has 25 years of experience in applied image processing and machine learning for security, industrial, and medical imaging applications, including real-time implementations of compute-intensive algorithms on parallel computing systems. He earned the B.S., M.S., and Ph.D. degrees in Electrical Engineering from the University of Tennessee, Knoxville, with a thesis research focus on x-ray computed tomography and 2D and 3D model-based medical image segmentation. He has authored and coauthored over 100 publications, three book chapters, and has been issued 8 patents in the field of electrical engineering and computer vision. He is a Senior Member of the IEEE, was chair of the East TN Chapter of the IEEE Engineering in Medicine and Biology Society (2008-2013), and has been an associate editor of the SPIE Journal of Electronic Imaging since 2008.

EDUCATION

Ph.D. Electrical Engineering, University of Tennessee, Knoxville, 2001
M.S. Electrical Engineering, University of Tennessee, Knoxville, 1992
B.S. Electrical Engineering, University of Tennessee, Knoxville, 1989

PROFESSIONAL EXPERIENCE

Director, Computational Sciences and Engineering Division, Oak Ridge National Laboratory, 2013-Present

- Establish the R&D strategy for seven R&D groups:
 - Data analytics
 - Modeling & simulation
 - Cyber security

- Data systems
- Quantum science
- Geographic information science
- Discrete Computing Systems
- Manage a \$50M budget for 150 staff

Director of Institutional Planning, Oak Ridge National Laboratory, 2011-2013

- Responsible for ORNL's science and technology strategic planning process.
- Laboratory Directed R&D and program development investment management for ORNL (\$50M+ budget).
- Responsible for coordination of ORNL's scientific honors and awards program.
- Serving as the Chair of the Information Technology Advisory Council (ITAC) which sets the strategic roadmap for ORNL's IT application investment and oversees IT project execution.
- Developing and implementing a suite of S&T metrics to track scientific impact of ORNL.

Group Leader and Distinguished Research & Development Staff Member, Oak Ridge National Laboratory, 2008-2011

- Responsible for management of technical staff members within Image Science and Machine Vision group (13 PhD staff, 4 MS staff, 1 post-doc, 1 post-masters, 2 graduate students. ~\$7M budget).
- Responsible for overall strategic planning and program development activities within R&D portfolio of the group.
- Principal Investigator of ~\$1M total annual budget for computer-vision R&D projects in medical imaging and satellite image analysis.
- Co-Principle Investigator responsible for \$3M program in signal analysis and pattern recognition program for the Marine Corps Light Armored Vehicle Program (2010-2011)

Director of Preclinical Research & Development, Siemens Molecular Imaging, 2007-2008

- Responsible for all of Siemens Preclinical product development activities including small animal CT, PET, and SPECT modalities.
- Responsible for five functional research groups comprised of 18 scientists (6 PhD), engineers (10 MS or BS), and technicians (2 AD).
- Duties include overseeing all R&D activities, interfacing with product management team to define requirements, resources, budgets, and schedules for all new product development projects, direct interaction with manufacturing engineers as products are moved from development into full production.
- Participate in strategic planning activities to set direction for preclinical research and business.

Director of Preclinical CT & SPECT Products, Siemens Medical (CTI, Inc.), 2004-2006

- Liaison between CT & SPECT R&D activities and product management/sales team.
- Interacted heavily with service organization to provide education on efficient service/troubleshooting techniques for small animal CT and SPECT scanners.
- Project Manager for the “Inveon Multimodality” development, which is now the Siemens Preclinical flagship small animal scanning platform. This platform was designed to support CT, SPECT, and PET imaging modalities. Project management included all ISO design and production standard operating procedures.

Co-founder and Vice President, ImTek, Inc., 1998-2004

- Co-founded ImTek, Inc. in Knoxville, TN. Negotiated license agreements with ORNL for transfer of microCT software technology. Played critical role in leading ImTek to become (1) the world-leading provider of small animal x-ray microCT scanners, (2) a company with 100% sales growth each of the first four years resulting in > \$5M in revenue for FY 2004, (3) a company with a new multi-modality CT-SPECT product offering in 2004 (4) a profitable company with no debt and no outside capitalization.
- Played a key role in establishing a formal partnership between ImTek and Philips Medical Systems, where Philips became the exclusive sales and marketing arm of ImTek.
- Managed the development and commercialization of all image reconstruction, visualization, and analysis product development for ImTek’s small animal microCT products.
- Led partnership with multi-processor hardware development company to create a real-time image reconstruction engine for use with ImTek’s microCT scanners.
- Was engaged in the sales process from initial contact to final close for over 30 imaging systems sold since the foundation of ImTek. This includes ImTek’s first two sales in Europe in 2003.
- Shared responsibility for searching for, interviewing, hiring, and managing employees including administrative support, technicians, hardware engineers and software engineers.

PATENTS

“Imaging system warp correction with phantom assembly,” Yan, S. and Griffin, S. and Gleason, S. and Burbar, Z., Patent #8,988,601, issued March 2015.

“Quantitative Phase-Imaging Systems,” C. J. Mann, P. R. Bingham, S. S. Gleason, patent #8,248,614, issued August 2012.

“System and Method for Generating Motion Corrected Tomographic Images,” S. S. Gleason, J.S. Goddard, patent #8,170,302, issued May 2012.

“Method for non-referential defect characterization using fractal encoding and active contours,” S. S. Gleason, H. Sari- Sarraf, patent #7,218,772, issued May 2007.

“Anatomic and functional imaging of tagged molecules in animals,” Weisenberger; Andrew G., Majewski; Stanislaw, Paulus; Michael J., Gleason; Shaun S., patent # 7,209,579, issued April 2007.

“Contextual-based System for Automatic Defect Classification Using Multiple Morphological Masks,” Shaun S. Gleason, Martin A. Hunt, and Hamed Sari-Sarraf, patent # 6,456,899, issued September 2002.

“Ultra-High Resolution Computed Tomography Imaging,” M. J. Paulus, H. Sari-Sarraf, S. S. Gleason, K. W. Tobin, C. E. Thomas, #6,421,409, issued July 2002.

“Automatic Detection of Bone Fragments in Poultry using Multi-Energy X-rays,” S. S. Gleason, M. J. Paulus, and J. A. Mullens, patent #6,370,223, issued April 2002.

“Automated Defect Spatial Signature Analysis for Semiconductor Manufacturing Process Improvement,” S. S. Gleason, T. P. Karnowski, H. Sari-Sarraf, and K. W. Tobin, Jr., patent #5,982,920, issued November 1999.

PROFESSIONAL SOCIETIES

Senior Member, IEEE

Chair, East Tennessee Chapter of the IEEE Engineering in Medicine and Biology Society, 2008-2013

INVITED PRESENTATIONS (Recent)

Gleason S. S., “Current R&D and New Directions for Data Science and Machine Learning at ORNL,” Seminar for the Center for Intelligent Systems and Machine Learning (CISML), November 7, 2015.

Gleason S. S., “Workforce Needs for Next Generation Big Data Analytics,” ORAU Annual Meeting on Big Data Analytics: Challenges and Opportunities, March 4, 2015.

Gleason S. S., “An ORNL Initiative: Internet-of-Things Science Collaboration Laboratory (ISciCL),” Future of Instrumentation and Internet Workshop, May 4-6, 2015.

Gleason S. S., "Cyber Security R&D for the Nation," to the Congressional Caucus on Cyber Security, June, 2015.

BOOK CHAPTERS

1. Gleason, S., Paulus, M., Osborne, D., Molecular Imaging: Principles and Practice: Principles of Micro X-ray Computed Tomography, Weissleder, R., *et al.*, eds., McGraw Hill, ISBN 9781607950059, 2010
2. Gleason, S., Paquit, V., Aykac, D., Quantitative Magnetic Resonance Imaging in Cancer: From Theory to Clinical Applications: Image Segmentation, Yankeelov, T., *et al.*, eds., CRC Press, ISBN 978-1-4398-2057-5, 2011.
3. Miller, S., Bilheux, J., Gleason, S., Nichols, T., Bingham, P., Green, M., Medical Imaging: Large-scale User Facility Imaging and Scattering Techniques to Facilitate Basic Medical Research, ISBN 978-953-307-774-1, 2011.

SELECTED PUBLICATIONS

1. Jiangye Yuan, Shaun S. Gleason, Anil M. Cheriyyadat, "Systematic Benchmarking of Aerial Image Segmentation," IEEE Transactions on Geoscience and Remote Sensing, submitted, January 2013.
2. Vatsavai, R.R.; Bhaduri, B.; Cheriyyadat, A.; Arrowood, L.; Bright, E.; Gleason, S.; Diegert, C.; Katsaggelos, A.; Pappas, T.; Porter, R.; Bollinger, J.; Chen, B.; Hohimer, R.; , "Geospatial image mining for nuclear proliferation detection: Challenges and new opportunities," Geoscience and Remote Sensing Symposium (IGARSS), 2011 IEEE International , vol., no., pp.48 51, 25-30 July 2011.
3. Roberts, R. S.; Pope, P. A.; Vatsavai, R. R.; Jiang, M.; Arrowood, L. F.; Trucano, T. G.; Gleason, S.; Cheriyyadat, A.; Sorokine, A.; Katsaggelos, A. K.; Pappas, T. N.; Gaines, L. R.; Chilton, L. K.;, "Design of benchmark imagery for validating facility annotation algorithms," to appear in the Proc. IEEE International Geoscience And Remote Sensing Symposium, July 24-29, 2011, Vancouver, Canada
4. S. Gleason, M. Dema, H. Sari-Sarraf, A. Cheriyyadat, R. Vatsavai, R. Ferrell. "Verification & Validation of a Semantic Image Tagging Framework via Generation of Geospatial Imagery Ground Truth." IEEE International Geoscience and Remote Sensing Symposium. August 2011.
5. Martins RA, Davis D, Kerekes R, Zhang J, Bayazitov IT, Hiler D, Karakaya M, Frase S, Gleason S, Zakharenko SS, Johnson DA, Dyer MA. Retinoblastoma (Rb) regulates laminar dendritic arbor reorganization in retinal horizontal neurons. Proc Natl Acad Sci USA. 2011 Dec 27;108(52):21111-6. doi: 10.1073/pnas.1108141108. Epub 2011 Dec 12. PubMed PMID: 22160703; PubMed Central PMCID: PMC3248513.
6. Sridharan Kamalakannan; Christopher J. Mann; Philip R. Bingham; Thomas P. Karnowski; Shaun S. Gleason, "Automatic firearm class identification from cartridge cases," SPIE Proceeding on Image Processing: Machine Vision Applications IV, vol. 7877, #78770P, February, 2011.

7. C. Mann, P. Bingham, H. Lin, V. Paquit, S. Gleason, "Dual Modality Live Cell Imaging with Multiple-Wavelength Digital Holography and Epi-Fluorescence," *3D Research* 01, 05, 2011.
8. Vincent C. Paquit, Shaun S. Gleason and Udaya C. Kalluri, "Monitoring plant growth using high resolution micro-CT images", Proc. SPIE 7877, 78770W (2011). doi:10.1117/12.876719 (http://spiedigitallibrary.org/proceedings/resource/2/psidg/7877/1/78770W_1)
9. Kerekes, R.A.; Gleason, S.S.; Martins, R.A.P.; Dyer, M.; , "Fully automated segmentation and characterization of the dendritic trees of retinal horizontal neurons," Biomedical Sciences and Engineering Conference (BSEC), 2010 , vol., no., pp.1-4, 25-26 May 2010. doi: 10.1109/BSEC.2010.5510843. URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5510843&isnumber=5510791>
10. Shaun Gleason, Vincent Paquit, Hassina Bilheux, Udaya Kalluri, "X-ray and Neutron Imaging for Plant System Biology Investigations," Proc. of the Future of Instrumentation International Workshop, November, 2010.
11. Ranga Raju Vatsavai, Anil Cheriyyadat, Shaun Gleason: Unsupervised Semantic Labeling Framework for Identification of Complex Facilities in High-resolution Remote Sensing Images. In the proceedings of the IEEE ICDM International workshop on Spatial and Spatiotemporal Data Mining (SSTDM-10), IEEE, December 2010.
12. Gleason SS, Ferrell RK, Cheriyyadat A, Vatsavai R, De S, "Semantic Information Extraction from Multispectral Geospatial Imagery via a Flexible Framework," Invited Paper, IEEE International Geoscience and Remote Sensing Symposium, 2010.
13. Vatsavai, R., Cheriyyadat, A., Gleason, S., Ferrell, R., "Supervised Semantic Classification for Nuclear Nonproliferation Monitoring," IEEE Applied Imagery and Pattern Recognition Workshop, 2010.
14. Kerekes, Ryan A.; Gleason, Shaun S.; Trivedi, Niraj; Solecki, David J., "Automated method for tracing leading and trailing processes of migrating neurons in confocal image sequences", Medical Imaging 2010: Image Processing. Edited by Dawant, Benoit M.; Haynor, David R. Proceedings of the SPIE, Volume 7623, pp. 76233T-76233T-10 (2010).
15. Ryan A. Kerekes, Rodrigo A. P. Martins, Denise Davis, Mahmut Karakaya, Shaun Gleason and Michael A. Dyer. Automated Tracing of Horizontal Neuron Processes During Retinal Development. *Neurochemical Research*, vol. 36, no. 4, pp. 583-593, 2011.
16. Mahmut Karakaya, Ryan A. Kerekes, Shaun S. Gleason, Rodrigo A. P. Martins, and Michael Dyer, "Automatic Detection, Segmentation and Characterization of Retinal Horizontal Neurons in Large-scale 3D Confocal Imagery", submitted to SPIE MIC 2011.
17. Solecki DJ, Trivedi N, Govek EE, Kerekes RA, Gleason SS, and Hatten ME, "Par6 α regulated Myosin II motors drive the coordinated movement of centrosome and soma during glial-guided neuronal migration," *Neuron* 63(1):63-80, 2009.