

Sharon X. Huang

A. BIOGRAPHICAL INFORMATION

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Education

Rutgers, the State University of New Jersey, New Brunswick, NJ
Ph.D. in Computer Science, May 2006

Rutgers, the State University of New Jersey, New Brunswick, NJ
M.S. in Computer Science, May 2001

Tsinghua University, Beijing, China
B.E. in Computer Science, June 1999

Professional Experience

David Reese Professor, The Pennsylvania State University, University Park, PA, 08/2024 – present
Professor, The Pennsylvania State University, University Park, PA, 07/2022 – present
Associate Dean for Undergraduate Studies, College of IST, Penn State University, 07/2023 – 07/2024
Data Sciences Program Coordinator, College of IST, Penn State University, 08/2019 – 06/2023
Associate Professor, The Pennsylvania State University, University Park, PA, 08/2018 – 06/2022
Associate Professor, Lehigh University, Bethlehem, PA, 06/2013 – 08/2018
Assistant Professor, Lehigh University, Bethlehem, PA, 08/2006 – 06/2013
Staff Scientist, Siemens Medical Solutions USA, Inc., Malvern, PA, 08/2005 - 08/2006
Research Assistant, Rutgers University, New Brunswick, NJ, 08/2002 – 06/2005
Teaching Assistant, Rutgers University, New Brunswick, NJ, 08/1999 – 05/2002
Summer Intern, Siemens Corporate Research, Inc., Princeton, NJ, 2001 and 2003
Research Programmer, Tsinghua University, Beijing, China, 1998-1999

B. PUBLICATIONS AND CREATIVE ACTIVITIES

Articles in Refereed Journals

- J. Liu, Y. Xue, H. Ni, R. Yu, Z. Zhou, S.X. Huang, “Computer-Aided Layout Generation for Building Design: A Review,” Accepted to appear in *Computational Visual Media*, 2025.
- M.H. Guo, Y. Zhang, T.J. Mu, S.X. Huang, S.M. Hu, “Tuning Vision-Language Models with Multiple Prototypes Clustering,” In *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Vol. 46, No. 12, pp. 11186-11199, 2024.
- M.A. Yakovlev, K. Liang, C.R. Zaino, D.J. Vanselow, A.L. Sugarman, A.Y. Lin, P.J. La Riviere, Y. Zheng, J.D. Silverman, J.C. Leichty, S. X. Huang, K.C. Cheng, “Quantitative Geometric Modeling of Blood Cells from X-ray Histotomograms of Whole Zebrafish Larvae,” In *eLife*, 2024.
- A.S. Adishesha, D.J. Vanselow, P. La Riviere, K.C. Cheng, S.X. Huang, “Sinogram domain angular upsampling of sparse-view micro-CT with dense residual hierarchical transformer and attention-weighted loss,” In *Computer Methods and Programs in Biomedicine*, Vol. 242, No. C, Article No. 107802, 2024.
- H.S. Yang, F. Wang, M. Greenblatt, S.X. Huang, Y. Zhang, “AI Chatbots in Clinical Laboratory Medicine: Foundations and Trends,” In *Clinical Chemistry*, hvad106, 2023.
- A.S. Adishesha, L. Jakielaszek, F. Azhar, P. Zhang, V. Honavar, F. Ma, C. Belani, P. Mitra, S.X. Huang, “Forecasting User Interests Through Topic Tag Predictions in Online Health Communities,” In *IEEE Journal of Biomedical and Health Informatics*, Vol. 27, No. 7, pp. 3645-55, 2023.
- H. Liu, Y. Liu, T.-J. Mu, X. Huang, S.M. Hu, “Skeleton-CutMix: Mixing Up Skeleton With Probabilistic

- Bone Exchange for Supervised Domain Adaptation,” In *IEEE Trans. on Image Processing*, Vol. 32, pp. 4046-58, 2023.
- Y. Ou, S.X. Huang, K. Wong, J. Cummock, J. Volpi, J.Z. Wang, S. TC Wong, “BBox-Guided Segmentor: Leveraging expert knowledge for accurate stroke lesion segmentation using weakly supervised bounding box prior,” In *Computerized Medical Imaging and Graphics*, Vol. 107, article No. 102236, 2023.
- H. Ni, Y. Xue, L. Ma, Q. Zhang, X. Li, S.X. Huang, “Semi-supervised Body Parsing and Pose Estimation for Enhancing Infant General Movement Assessment,” In *Medical Image Analysis*, Vol. 83, article No. 102654, 2023.
- K. Liang, J. Tan, D. Zeng, Y. Huang, X. Huang, G. Tan, “ABSLearn: a GNN-based framework for aliasing and buffer-size information retrieval,” In *Pattern Analysis and Applications*, 2023.
- J. Ye, Y.-T. Yeh, Y. Xue, Z. Wang, N. Zhang, L. He, K. Zhang, R. Ricker, Z. Yu, A. Roder, N.P. Lopez, L. Organtini, W. Greene, S. Hafenstein, H. Lu, E. Ghedin, M. Terrones, S. Huang, S.X. Huang, “Accurate virus identification with interpretable Raman signatures by machine learning,” In *The Proceedings of the National Academy of Sciences*, 119 (23), e2118836119, 2022.
- K. Zhang, Z. Wang, H. Liu, N. Perea-Lopez, J. Ranasinghe, G. Bepete, A. Minns, R. Rossi, S. Lindner, S.X. Huang, M. Terrones, S. Huang, “Understanding the Excitation Wavelength Dependence and Thermal Stability of the SARS-CoV-2 Receptor-Binding Domain Using Surface-Enhanced Raman Scattering and Machine Learning,” In *ACS Photonics*, 9(9), pp. 2963-72, 2022.
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- M.S. Tawfik, A.S. Adishesha, Y. Hsi, P. Purswani, R.T. Johns, P. Shokouhi, X. Huang, Z.T. Karpyn, “Comparative Study of Traditional and Deep-Learning Denoising Approaches for Image-Based Petrophysical Characterization of Porous Media,” In *Frontiers in Water*, 3: 800369, 2022.
- Y. Xue, Y.C. Guo, H. Zhang, T. Xu, S.H. Zhang, X. Huang, “Deep Image Synthesis from Intuitive User Input: A Review and Perspectives,” In *Computational Visual Media*, 8(1), pp. 3-31, 2022.
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- V. Pisztora, Y. Ou, X. Huang, F. Chiaromonte, J. Li, “Epsilon Consistent Mixup: Structural Regularization with an Adaptive Consistency-Interpolation Tradeoff,” In *Stat*, p. e425, Sept. 2021.
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- H. Liu, T.J. Mu, X. Huang, “Detecting human-object interaction with multi-level pairwise feature network,” In *Computational Visual Media*, 7(2), pp. 229-239, 2021.
- S. Wang, Y. Zhou, X. Qin, S. Nair, X. Huang, Y. Liu, “Label-free detection of rare circulating tumor cells by image analysis and machine learning,” In *Scientific Reports*, Vol. 10, article No. 12226, 2020.
- P. Purswani, Z.T. Karpyn, K. Enab, Y. Xue, X. Huang, “Evaluation of image segmentation techniques for image-based rock property estimation,” In *Journal of Petroleum Science and Engineering*, Vol. 195, article No. 107890, 2020.
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- T. Xu, C. Langouras, M. A. Koudehi, B. E. Vos, N. Wang, G. H. Koenderink, X. Huang, and D. Vavylonis,

- “Automated Tracking of Biopolymer Growth and Network Deformation with TSOAX,” In *Scientific Reports*, 9(1), 1717, 2019.
- Y. Ma, T. Xu, X. Huang, X. Wang, C. Li, J. Jerwick, Y. Ning, X. Zeng, B. Wang, Y. Wang, Z. Zhang, X. Zhang, C. Zhou, “Computer-Aided Diagnosis of Label-Free 3D Optical Coherence Microscopy Images of Human Cervical Tissue,” In *IEEE Trans. on Biomedical Engineering*, 66(9): 2447-2456, 2019.
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- H. Zhang, T. Xu, H. Li, S. Zhang, X. Wang, X. Huang, D. Metaxas, “StackGAN++: Realistic Image Synthesis with Stacked Generative Adversarial Networks,” In *IEEE Trans. On Pattern Analysis and Machine Intelligence*, Vol. 41, No. 8, pp. 1947-1962, 2018.
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- M. Cheng, N.J. Mitra, X. Huang, P.H.S. Torr, S.M. Hu, “Global Contrast Based Salient Region Detection,” In *IEEE Trans. on Pattern Analysis and Machine Intelligence (TPAMI)*, Vol. 37, No. 3, pp. 569-82, 2015.
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- M. Cheng, N.J. Mitra, X. Huang, S.M. Hu, “SalientShape: Group Saliency in Image Collections,” In *The Visual Computer*, Vol. 30, No. 4, pp. 443-453, 2014.
- T. Xu, F. Li, D-H T. Nguyen, C.S. Chen, C. Zhou, X. Huang, “Delineating 3D Angiogenic Sprouting in OCT Images via Multiple Active Contours,” In *Lecture Notes in Computer Science (LNCS)*, Vol. 8090: *Augmented Reality Environments for Medical Imaging and Computer-Assisted Interventions*, pp. 231-240, 2013.
- H. Li, X. Huang, L. He, “Object Matching Using A Locally Affine Invariant and Linear Programming Techniques,” In *IEEE Trans. on Pattern Analysis and Machine Intelligence (TPAMI)*, Vol. 35, No. 2, pp. 411-424, 2013.
- X. Huang, Y. Zhu, H. Li, H. Guan, V. Potesil, Y. Song, T. Kubota, X. Zhou, “Automatic Tumour Delineation in Whole Body PET/CT Images,” In *International Journal of Biomedical Engineering and Technology*

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X. Huang, H. Li, Y. Zhu, "Hybrid Deformable Image Registration using a Closed-form Free Form Deformation Approach," In *International Journal of Biomedical Engineering and Technology (IJBET)*, Vol. 8, No. 2/3, pp. 245-258, 2012.

H. Li, T. Shen, X. Huang, "Approximately Global Optimization for Robust Alignment of Generalized Shapes," In *IEEE Trans. on Pattern Analysis and Machine Intelligence (TPAMI)*, Vol. 33, No. 6, pp. 1116-1131, 2011.

E. Kim, X. Huang, G. Tan, "Markup SVG - An Online Content Aware Image Abstraction and Annotation Tool," In *IEEE Trans. on Multimedia (TMM)*, Vol. 13, No. 5, pp. 993-1006, 2011.

T. Shen, H. Li, X. Huang, "Active Volume Models for Medical Image Segmentation," In *IEEE Trans. on Medical Imaging (TMI)*, Vol. 30, No. 3, pp. 774-791, 2011.

W. Wang, X. Huang, A. Esmaili, "Texture Based Foam Segmentation and Analysis," In *Industrial & Engineering Chemistry Research*, Vol. 50, No. 10, pp. 6071-6081, 2011.

M. B. Smith, H. Li, T. Shen, X. Huang, E. Yusuf, D. Vavylonis, "Segmentation and Tracking of Cytoskeletal Filaments using Open Active Contours," In *Cytoskeleton*, Vol. 67, No. 11, pp. 693-705, November 2010.

M. Cheng, F.L. Zhang, N. J. Mitra, X. Huang, S.M. Hu, "RepFinder: Finding Approximately Repeated Scene Elements for Image Editing," In *ACM Trans. on Graphics*, Vol. 29, No. 4, 2010. Also in *SIGGRAPH*, 2010.

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X. Huang, D. Metaxas, "Metamorphs: Deformable Shape and Appearance Models," In *IEEE Trans. Pattern Analysis and Machine Intelligence (TPAMI)*, Vol. 30, No. 8, pp. 1444-1459, 2008.

X. Huang, N. Paragios, D. Metaxas, "Shape Registration in Implicit Spaces using Information Theory and Free Form Deformations," In *IEEE Trans. on Pattern Analysis and Machine Intelligence (TPAMI)*, Vol. 28, No. 8, pp. 1303-1318, 2006.

Y. Wang, X. Huang, C.-S. Lee, S. Zhang, Z. Li, D. Samaras, D. Metaxas, A. Elgammal, and P. Huang, "High Resolution Acquisition, Learning and Transfer of Dynamic 3-D Facial Expressions," In *Computer Graphics Forum*, Vol. 23, No. 3, pp. 677-686, 2004. Also in *Eurographics*, 2004.

Refereed Highly Selective Conference Papers

T. Cai, H. Ni, W. Ma, Y. Xue, Q. Ma, K. Wong, J. Volpi, S. T.C. Wong, J.Z. Wang, and S.X. Huang, "SafeTriage: Facial Video De-identification for Privacy-Preserving Stroke Triage," Accepted to appear in *Proc. of International Conf. on Information Processing in Medical Imaging (IPMI)*, 2025.

J. Liu, R. Yu, S. Chen, S.X. Huang, H. Guo, "Towards In-the-wild 3D Plane Reconstruction from a Single Image," Accepted to appear in *Proc. of IEEE/CVF Conf. on Computer Vision and Pattern Recognition (CVPR)*, 2025.

W. Zhao, J. Liu, S. Zhang, Y. Li, S. Chen, S.X. Huang, Y.J. Liu, H. Guo, "MonoPlane: Exploiting Monocular Geometric Cues for Generalizable 3D Plane Reconstruction," In *Proc. of IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 8481-8488, 2024.

R. Yu, J. Liu, Z. Zhou, S.X. Huang, "NeRF-Enhanced Outpainting for Faithful Field-of-View Extrapolation," In *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, 2024.

T. Cai, K. Wong, J.Z. Wang, S.X. Huang, X. Yu, J.J. Volpi, S. TC Wong, "M³ Stroke: Multi-Modal Mobile AI for Emergency Triage of Mild to Moderate Acute Strokes," In *Proc. of IEEE-EMBS International Conference on Biomedical and Health Informatics*, pp. 1-8, 2024.

H. Ni, B. Egger, S. Lohit, A. Cherian, Y. Wang, T. Koike-Akino, S.X. Huang, T.K. Marks, "TI2V-Zero: Zero-Shot Image Conditioning for Text-to-Video Diffusion Models," In *Proc. of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, pp. 9015-9025, 2024.

- G.Y. Yang, G.K. Nakayama, Z.K. Xiao, T.-J. Mu, X. Huang, S.M. Hu, "Semantic-Aware Transformation-Invariant RoI Align," In *Proc. of the AAAI Conference on Artificial Intelligence (AAAI)*, Vol. 38, No. 6, pp. 6486-6493, 2024.
- H. Ni, J. Liu, Y. Xue, S.X. Huang, "3D-aware Talking-head Video Motion Transfer," In *Proc. of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, pp. 4954-4964, 2024.
- J. Ye, H. Ni, P. Jin, S.X. Huang, Y. Xue, "Synthetic Augmentation with Large-Scale Unconditional Pre-training," In *Proc. of the International Conf. on Medical Image Computing and Computer-Assisted Intervention (MICCAI)*, pp. 754-764, 2023.
- R. Yu, J. Wang, S. Ma, S.X. Huang, G. Krishnan, Y. Wu, "Be Real in Scale: Swing for True Scale in Dual Camera Mode," In *Proc. of International Symposium on Mixed and Augmented Reality (ISMAR)*, pp. 1231-1239, 2023.
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- H. Ni, Y. Liu, S.X. Huang, Y. Xue, "Cross-identity Video Motion Retargeting with Joint Transformation and Synthesis," In *Proc. of IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, pp. pp. 412-422, 2023.
- J. Liu, Y. Xue, J. Duarte, K. Shekhawat, Z. Zhou, X. Huang, "End-to-end Graph-constrained Vectorized Floorplan Generation with Panoptic Refinement," In *Proc. of the European Conference on Computer Vision (ECCV)*, pp. 547-562, 2022.
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- Y. Xue, Z. Zhou, X. Huang, "Neural Wireframe Renderer: Learning Wireframe to Image Translations," In *Proc. of the European Conference on Computer Vision (ECCV)*, pp. 279-295, 2020.
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- Y. Xue, Q. Zhou, J. Ye, L. R. Long, S. Antani, C. Cornwell, Z. Xue, X. Huang, "Synthetic Augmentation and Feature-based Filtering for Improved Cervical Histopathology Image Classification," In *Proc. Of International Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, pp. 387-396, 2019. (Winner of Best Presentation)
- Y. Xue, X. Huang, "Improved Disease Classification in Chest X-rays with Transferred Features from Report Generation," In *Proc. of International Conf. on Information Processing in Medical Imaging (IPMI)*, pp. 125-138, 2019.
- Y. Xue, T. Xu, L.R. Long, Z. Xue, S. Antani, G.R. Thoma, X. Huang, "Multimodal Recurrent Model with Attention for Automated Radiology Report Generation," In *Proc. Of International Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, pp. 457-466, 2018.
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- Z. Zhu, D. Liang, S. Zhang, X. Huang, B. Li, S. Hu, "Traffic-Sign Detection and Classification in the Wild," In *Proc. of IEEE Computer Society Conf. on Computer Vision and Pattern Recognition (CVPR)*, pp. 2110-2118, 2016.
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- Y. Li, C. Chen, X. Huang, J. Huang, "Instrument Tracking via Online Learning in Retinal Microsurgery," In *Proc. of International Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, LNCS Vol. 8673, pp. 464-71, 2014. (MICCAI Young Scientist Paper Award Runners up)
- E. Kim, H. Li, X. Huang, "A Hierarchical Image Clustering Cosegmentation Framework," In *Proc. of IEEE Computer Society Conf. on Computer Vision and Pattern Recognition (CVPR)*, pp. 686-693, 2012.
- M. Gao, J. Huang, X. Huang, S. Zhang, D. Metaxas, "Simplified Labeling Process for Medical Image Segmentation," In *Proc. of International Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, pp. 387-394, 2012.
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- H. Li, J. Huang, S. Zhang, X. Huang, "Optimal Object Matching via Convexification and Composition," In *Proc. of International Conf. on Computer Vision (ICCV)*, pp. 33-40, 2011.
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- E. Kim, X. Huang, J. Heflin, "Finding VIPS - A Visual Image Persons Search Using a Content Property Reasoner and Web Ontology," In *Proc. of IEEE International Conf. on Multimedia & Expo (ICME)*, 2011.
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C. HONORS AND AWARDS

- David Reese Endowed Professorship, The Pennsylvania State University, 2024
- Undergraduate Program Leadership Award (for Data Sciences Program), The Pennsylvania State University, 2022
- MEDIA Best Paper Award Runner Up, Elsevier, 2021
- Outstanding Reviewer Award, by Computers in Biology and Medicine (CBM) journal, 2015
- P.C. Rossin Assistant Professorship, Lehigh University, 2009
- Minority Junior Faculty Award for Career Enhancement, Christian R. and Mary F. Lindback Foundation, 2007
- Outstanding Reviewer Award, at the IEEE International Conf. on Computer Vision (ICCV), 2007
- DIMACS Award for Student-initiated Research Projects, Rutgers University, 2002

D. RESEARCH FUNDING

Competitively Awarded Research Grants

- "DeepStroke+: An Advanced Mobile AI Diagnostic Tool for Fast and Precise Detection of Acute Strokes in Mobile Stroke Units, Emergency Rooms, and Telestroke Triage," National Institutes of Health, (with S. T.C. Wong, K. Wong, J. Volpi, J. Wang, T.-H. K. Huang, S. Abdullah), \$2,987,132, 2/1/2025 - 1/31/2030.
- "SCH: AI-Enhanced Multimodal Sensor-on-a-chip for Alzheimer's Disease Detection," National Institutes of Health, (with F. Ma, S. Huang, J. Hu, and C. Zhang), \$1,176,289, 9/1/2022 - 5/31/2026.
- "AI Learning to Retrieve and Generate Educational Videos with Equitable Ambient Cues," PSU College of IST seed grant, (with C.M. Kim), \$34,000, 7/1/2023 - 12/31/2024.
- "GCR: Understanding Virus Evolution Through Deep Raman Spectroscopy," National Science Foundation, (with M. Terrones, Y. Yeh, E. Ghedin, and S. Huang), \$2,500,000, 10/01/2019 - 9/30/2024.
- "Groundwork for a Synchrotron MicroCT Imaging Resource for Biology (SMIRB)," National Institutes of Health, (with K.C. Cheng and P.L. Riviere), \$2,629,811, 8/15/2019 - 7/31/2023.
- "Evaluation of Potential Technology Pathway to Image Rock Properties," Department of Energy, via Leidos, Inc., (with Z. Karpyn and P. Shokouhi), \$299,676, 3/3/2020 - 12/31/2023.
- "Computer-based Stroke Analysis," Contract from Houston Methodist Hospital, (with J.Z. Wang), \$39,457, 8/15/2022 - 8/14/2023.
- "Prototyping Patient-Centric Personal Health Libraries," via NSF Center for Health Organization and Transformation (CHOT), (with P. Mitra and F. Ma), \$50,000, 6/1/2021 - 5/31/2022.
- "EAGER: Portable device for rapid and label-free identification of COVID-19 using an ultra-miniature handheld Raman spectrometer," National Science Foundation, (with M. Terrones, Y.T. Yeh, S. Huang, J. Robinson), \$300,000, 6/1/2020-5/31/2022.
- "Generative Adversarial Networks for Automatic Whole Slide Imaging Dataset Expansion and Analysis," National Institutes of Health, National Library of Medicine, \$120,000, 9/24/2018 - 9/23/2020.
- "Rapid identification and mutation detection of Coronavirus by 2D-enhanced Raman spectroscopy," PSU Huck/MRSEC/MRI Coronavirus Research Seed grant, (with Y.-T. Yeh, J. A. Robinson, S. Huang, H. Lu, E. Ghedin, and M. Terrones), \$160,000, 3/19/2020 - 9/18/2020.

- “Computational Phenotyping: Creating a High Performance Computing Infrastructure,” PSU Institute for Computational and Data Sciences (ICDS) seed grant, (with J. Liechty, K. Cheng, V.G. Honavar, Y. Zheng), \$25,000, 5/1/2020-4/30/2021.
- “Toward Dynamic Patient-centric Personal Health Libraries,” PSU ICDS & College of IST joint seed grant, (with P. Mitra, V.G. Honavar, F. Ma, K. Cheng), \$70,000, 5/1/2020-4/30/2021.
- “Integrating High-Throughput Materials Simulations and Deep Machine Learning for Optimizing Microstructures of Advance Energy Storage Materials,” PSU ICDS seed grant, (with L.Q. Chen), \$25,000, 5/1/2020-4/30/2021.
- “Learning to Generate Floor plans for Mass Customization of Housing,” PSU College of IST seed grant, (with Z. Zhou), 5/15/2020 - 5/14/2021.
- “Development of a Mobile AI-based Rapid Stroke Screening Method for Emergency Rooms,” PSU College of IST seed grant, (with J.Z. Wang), 5/15/2019 - 5/14/2020.
- “Mapping Reservoir Rock Composition of Conventional and Unconventional Deposits with Intelligent Imaging,” PSU College of EMS Energy Institute seed grant, (with Z. Karpyn), \$15,000, 5/15/2019 - 5/14/2020.
- “Medical Imaging and Analysis Enhancement via PCIe-based HPEC and 3D Holography,” Pennsylvania Infrastructure Technology Alliance (PITA), (with Accipiter Systems), \$40,000, 1/01/2018 - 3/31/2020.
- “Advanced Computational Methods for Anatomical and Functional Brain Data Analysis,” National Institutes of Health, National Library of Medicine, \$114,000, 9/21/2015 - 9/20/2018.
- “Endoplasmic Reticulum Stress and Hyperinsulinemia in Human Type 2 Diabetes and Equine Laminitis,” Lehigh University FIG grant, (with L. Cassimeris), \$30,000, 6/1/2016 - 6/1/2017.
- “Modeling and Analysis of Actin Filament Organization in Yeast,” National Institutes of Health, National Institute of General Medical Sciences, (with D. Vavylonis), \$1,357,748, 4/01/2012 - 12/31/2017.
- “A Secure, High Performance System Interconnect Architecture for Next Generation Data Centers,” Pennsylvania Infrastructure Technology Alliance, (with J. Li), \$36,075, 1/01/2015 - 6/30/2016.
- “Web-based Image Annotation and Retrieval; Computer-assisted Technologies for Medical Image Segmentation and Pattern Recognition,” National Institutes of Health, National Library of Medicine, \$275,000, 9/01/2010 - 8/31/2015.
- “III-CXT-Small: Collaborative Research: Structuring, Reasoning, and Querying in a Very Large Medical Image Database,” National Science Foundation, (with D. Lopresti), \$229,519, 9/01/2008 - 8/31/2011.
- “Computational Analysis and Modeling of Contractile Ring Assembly,” National Institutes of Health, National Institute of General Medical Sciences, (with D. Vavylonis), \$385,515, 9/01/2008 - 8/31/2011.
- “Technologies for Computer-Assisted Biomedical Image Segmentation and Content-based Image Retrieval through Web Browsers,” National Institutes of Health, National Library of Medicine, \$65,000, 9/15/2009 - 9/14/2010.
- “Network computing for biomedical image processing; cervigram segmentation,” National Institutes of Health, National Library of Medicine, \$55,000, 9/01/2008 - 08/31/2009.
- “Segmentation of Uterine Cervix Images by Support Vector Machine Methods,” National Institutes of Health, National Library of Medicine, \$24,900, 9/20/2007 - 9/19/2008.
- “A Physically-based Heart Model for Segmentation, Motion Analysis and Disease Classification,” Christian R. and Mary F. Lindback Foundation, \$20,000, 6/01/2007 - 5/31/2008.
- “Novel Methods and Applications for Chemical Image Analysis,” Air Products and Chemicals, Inc., (with R. Nagel, and A. Esmaili), \$80,000, 9/01/2007 - 12/31/2010.
- “Novel Methods and Applications for Chemical Image Analysis,” Pennsylvania Infrastructure Technology Alliance, (with R. Nagel), \$44,000, 3/01/2008 - 8/31/2009.

Competitively Awarded Training Grants

- “Analysis of actin cytoskeleton structures using active contours,” Biosystems Dynamics Summer Institute (BDSI), Howard Hughes Medical Institute and Lehigh University, (with D. Vavylonis), \$30,000, 6/01/2010 - 8/01/2010.
- “Actin filament polymerization: modeling of elongation kinetics based on analysis of TIRFM images,” Biosystems Dynamics Summer Institute (BDSI), Howard Hughes Medical Institute and Lehigh University, (with D. Vavylonis), \$29,000, 6/01/2009 - 8/01/2009.

E. EDITORIAL REVIEW BOARD MEMBERSHIP FOR SCHOLARLY PUBLICATIONS

Editorial Review Board Membership for Journals

Associate Editor for Medical Image Analysis (MEDIA) journal, 2021 - present
Associate Editor for Computerized Medical Imaging and Graphics (CMIG) journal, 2021 - present
Computerized Medical Imaging and Graphics Journal Special Issue on "Learning with Imperfect Data for Medical Image Analysis," Co-Editor, Jun. 2023 - Mar. 2025
Associate Editor for Computer Vision and Image Understanding (CVIU) journal, 2014-2023
Medical Image Analysis Journal Special Issue on "Explainable and Generalizable Deep Learning Methods for Medical Image Computing", Co-Editor, May 2021 - Oct. 2022
Handling Editor for Computers in Biology and Medicine (CBM) journal, 2013-2018

Reviewer for Journals

IEEE Transactions on Pattern Analysis and Machine Intelligence
Medical Image Analysis
IEEE Transactions on Medical Imaging
Computer Vision and Image Understanding
International Journal of Computer Vision
IEEE Transactions on Biomedical Engineering
IEEE Transactions on Visualization and Computer Graphics
IEEE Transactions on Image Processing
IEEE Transactions on Neural Networks and Learning Systems
Computerized Medical Imaging and Graphics
Nature Communications
Frontiers
Image and Vision Computing
Pattern Recognition
Signal Processing
Machine Vision and Applications
Graphical Models
Computer-aided Design
NeuroComputing
NPJ Computational Materials
The Visual Computer
Cytometry
International Journal of Biomedical Imaging
Medical Physics
Micron

F. SCHOLARLY PRESENTATIONS

Invited Talks

- "Advanced Computer Vision Methods for Biomedical Image Segmentation, Classification, and Synthesis," Invited talk at the Penn State AI Grand Rounds Webinar, Oct. 30, 2024.
- "Synthetic Image and Video Generation for Data Augmentation and Sharing in Medical Applications," Invited talk at NSF Workshop on Algorithm-Hardware Co-design for Medical Applications, Sep. 27, 2024.
- "Foundation Models for Medical Image and Video Generation," Invited talk at the CVPR Workshop on Foundation Models for Medical Vision, Jun. 17, 2024.
- "Generating Synthetic Images and Videos for Data Augmentation and Sharing in Medical Applications," Invited talk at Boston University AI Seminar Series, Dec. 13, 2023.
- "Generating Synthetic Images and Videos for Data Augmentation and Sharing in Medical Applications," Invited talk at the CVPR Medical Computer Vision Workshop, Jun. 18, 2023.
- "Synthetic Data Augmentation for Improved Medical Image Classification and Segmentation," Invited talk at Olympus Japan, Virtual, Mar. 9, 2023.
- "Synthetic Data Augmentation for Improved Medical Image Classification and Segmentation," Keynote talk at the MICCAI Workshop on Medical Image Learning with Noisy and Limited Data, Sep. 21, 2022.
- "Deep Learning Models for Medical Image Synthesis and Segmentation," at Stony Brook University, BMI Grand Rounds Seminar Series, Virtual, Oct. 20, 2021.

- “Deep Learning Models for Medical Image Synthesis and Segmentation,” at University of Houston, Virtual, Oct. 11, 2021.
- “Learning Biomarkers from Biomedical Image Data,” at Penn State College of Medicine, Dec. 1, 2020.
- “Knowledge Discovery Within Images,” at Penn State Data Science Community Seminar Series, Apr. 20, 2020.
- “Learning Biomarkers from Biomedical Image Data,” at Rutgers University, New Brunswick, NJ, Nov. 25, 2019.
- “Learning Biomarkers from Biomedical Image Data,” at George Mason University, Fairfax, VA, Oct. 24, 2019.
- “Generative Adversarial Networks for Image Synthesis and Segmentation,” at College of IST Data Science Seminar Series, Penn State University, University Park, PA, Oct. 2, 2018.
- “Knowledge Discovery Within Images,” at Millennium Cafe, Penn State University, University Park, PA, Sept. 25, 2018.
- “SegAN: Adversarial Network with Multi-scale L_1 Loss for Medical Image Segmentation,” at The National Library of Medicine, Bethesda, MD, Sept. 19, 2017.
- “StackGAN: Text to Photo-realistic Image Synthesis,” at The National Library of Medicine, Bethesda, MD, Jan. 10, 2017.
- “Cervical Cancer Screening based on Images and Multiple Integrated Data Sources,” at The National Library of Medicine, Bethesda, MD, Mar. 24, 2015.
- “Object Matching using Affine Invariants and Linear Programming,” at Zhejiang University, Hangzhou, China, Jul. 19, 2014.
- “3D Actin Network Centerline Extraction with Multiple Active Contours,” at Ohio State University, Columbus, OH, Feb. 2014.
- “A Data-driven Image Interpretation System for Making Diagnosis Decisions in Cervical Screenings,” at Tsinghua University, Beijing, China, March 2013.
- “A Parallel Cellular Automata on the GPU for Interactive Brain Tumor Segmentation,” High Performance Computing Day at Lehigh University, Apr. 2011.
- “Deformable Object Models for Segmentation and Matching,” at Drexel University, Philadelphia, PA, Feb. 2011.
- “Nonrigid Shape Registration and Object Matching,” at University of Pennsylvania, Philadelphia, PA, Dec. 2010.
- “Analysis of Actin Cytoskeleton using Active Contour and Active Surface Models,” at Janelia Farm/HHMI Conference on “What Can Computer Vision Do for Neuroscience and Vice Versa?”, Ashburn, VA, Nov. 2010.
- “Markup SVG - A Content Aware Image Abstraction for Online Image Annotation,” at Tsinghua University, Beijing, China, Sept. 2010.
- “Deformable Shape and Appearance Models for Segmentation and Registration,” at Siemens Corporate Technology, Beijing, China, Sept. 2010.
- “Object Models for Boundary Extraction with Application to Medical Image Analysis,” at Temple University, Philadelphia, PA, Sept. 2009.
- “Deformable Shape and Appearance Models for Segmentation and Registration,” at Tsinghua University, Beijing, China, Jun. 2009.
- “Computational Analysis of Cellular Images,” COT (Center for Optical Technologies) Workshop on Advanced Biophotonic Imaging Technologies at Lehigh University, Oct. 2008.
- “Extracting Quantitative Information from Pictorial Input,” Applied Statistical Sciences Roundtable Seminar at Air Products and Chemicals, Inc., Sept. 2008.
- “High Performance Computing in Biomedical Image Analysis and Visualization,” High Performance Computing Day at Lehigh University, Apr. 2008.
- “Free-form Deformable Shape and Appearance Models,” at Boston University, Boston, MA, Sept. 2007.
- “Free-form Deformable Shape and Appearance Models,” at City College and the Graduate Center, City University of New York, New York, NY, May 2007.
- “CISL: Cervical Image Segmentation by Learning from Ground Truth Database,” at National Library of Medicine, Bethesda, MD, Mar. 2007.
- “Using Implicit Shape Representation for Registration and Segmentation,” at Stevens Institute of Technology, Hoboken, NJ, Nov. 2006.
- “Free Form Deformable Models,” at Univ. of North Carolina - Chapel Hill, Chapel Hill, NC, Apr. 2006.

- “Free Form Deformable Models,” at Lehigh University, Bethlehem, PA, Mar. 2006.
- “Integrating Shape and Appearance for Deformable Modeling and Segmentation,” at Siemens Corporate Research, Princeton, NJ, Feb. 2005.
- “Integrating Shape and Appearance for Deformable Modeling and Segmentation,” at Siemens Medical Solutions, Malvern, PA, Mar. 2005.
- “Hybrid Image Registration using Salient Region Features,” at Siemens Corporate Research, Princeton, NJ, Jul. 2004.

G. TEACHING AND RESEARCH ADVISING

Courses Taught

Instructor, College of Information Sciences and Technology, The Pennsylvania State University

- DS 320: Data Integration
Taught in Fall 2024
- DS 305: Algorithmic Methods and Tools
Taught in Spring 2023, Spring 2024
- DS 200: Introduction to Data Science
Taught in Fall 2022
- DS 397: Algorithmic Methods and Tools
Taught in Spring 2022
- IST 597: Machine Learning in Healthcare
Taught in Spring 2021
- DS 220: Data Management for Data Sciences
Taught in Fall 2020
- PSU 17: First-Year Seminar College of IST
Taught in Fall 2020, Fall 2021
- DS 330: Visual Analytics for Data Sciences
Taught in Fall 2019, Fall 2021
- IST 210: Organization of Data
Taught in Fall 2018, Fall 2019
- IST 597: Machine Learning Methods in Biomedical Image Informatics
Taught in Spring 2019

Instructor, Computer Science and Engineering Dept., Lehigh University

- CSE 261: Discrete Structures
Taught in Spring semesters 2012, 2013, 2014, 2016, 2017
- CSE 398/498: Deep Learning
Taught in Fall 2017
- CSE 313: Computer Graphics
Taught in Fall semesters 2006, 2007, 2008, 2009, 2011, 2012, 2013, 2014, 2015
- CSE 320/420: Biomedical Image Computing
Taught in Fall 2009, Spring 2012, Spring 2013, Fall 2014, Fall 2015
- CSE 319/419: Image Analysis and Graphics
Taught in Spring semesters 2007, 2008, 2009, 2010, 2011
- CSE 331: User Interface Systems and Techniques
Taught in Fall 2008

Advising – Research Direction

Doctoral Students

- Tian Shen, 2007-2011 (graduated with Ph.D. in May 2011; currently working as a Principal Research Scientist at SenseTime Research, Shanghai, China)
- Hongsheng Li, 2008-2012 (graduated with Ph.D. in September 2012; currently working as a tenured Associate Professor at the Chinese University of Hong Kong, Hong Kong)
- Edward Kim, 2008-2013 (graduated with Ph.D. in May 2013; currently working as a tenured Associate Professor at Drexel University, Philadelphia, PA)
- Yaoyao Zhu, 2007-2013 (graduated with Ph.D. in May 2013; currently working as a Senior Data Scientist at Fulton Bank, MA)

- Ting Xu, 2009-2016 (graduated with Ph.D. in August 2016; currently working as a Senior Research Engineer at Konica Minolta Business Solutions, CA)
- Tao Xu, 2013-2018 (graduated with Ph.D. in August 2018; currently working as an Applied Research Scientist at Meta, Menlo Park, CA)
- Yuan Xue, 2015-2021 (graduated with Ph.D. in May 2021; currently working as a tenure-track assistant professor at Ohio State University, Columbus, OH)
- Fengting Yang, 2021-2022 (co-advised with Z. Zhou; graduated with Ph.D. in May 2022; currently working as an Applied Research Scientist at Meta, Menlo Park, CA)
- Yanglan Ou, 2018-2023 (graduated with Ph.D. in May 2023; currently working as a Research Scientist at Trinity AGI, CA)
- Rui Yu, 2021-2023 (co-advised with Z. Zhou and J. Carroll; graduated with Ph.D. in August 2023; currently working as a tenure-track assistant professor at University of Louisville, Louisville, KY)
- Amogh Adishesha, 2019-2023 (graduated with Ph.D. in August 2023; currently working as an Applied Scientist at captions.ai)
- Haomiao Ni, 2019-2024 (graduated with Ph.D. in July 2024; currently working as a tenure-track assistant professor at the University of Memphis, Memphis, TN)
- Jiachen Liu, 2021-2024 (graduated with Ph.D. in July 2024; currently working as a machine learning engineer at TikTok)
- Jiarong (Karen) Ye, 2020 - present
- Matthew Poska, 2021 - present
- Peng Jin, 2021 - present

Undergraduate Students

- Advised 22 undergrad students for their research projects, 2019-2024, at Penn State.
- Advised 12 undergraduate students for their senior capstone projects, 2021, at Penn State.
- Advised 34 undergrad students for their research projects, 2006-2017, at Lehigh.

Master's Students

- Advised three Master's theses, 2019-2021, at Penn State.
- Advised 3 other Master's students for research project or independent study, 2018-2021, at Penn State.
- Advised 11 Master's students for their independent study or Master's thesis, 2006-2017, at Lehigh

Doctoral Committee Member for Other Ph.D. Students

- Served or serving on the doctoral dissertation committees for 24 Ph.D. students at Penn State, 2018-2024.
- Served on the doctoral dissertation committees for 20 Ph.D. students at Lehigh University, Rutgers University, and Drexel University, 2006 - 2022.

Advising – Other than Research Direction

- Advised undergraduate students in the Applied Data Sciences Option of the Data Sciences program on choosing their application focus areas, in the College of IST at Penn State University, 2019-2022.
- Advisor for Computer Science majors from College of Arts & Sciences and College of Engineering: advised approximately 40 undergraduate students each year, at Lehigh University, 2012-2018.
- Advisor for First Year Students: advised approximately 10 freshmen engineering students each year, at Lehigh University, 2015-2018.
- Advisor for Lehigh Integrated Business and Engineering (IBE) students who choose the Computer Science concentration: advised approximately 5 IBE-CS students each year, 2016-2018.

H. SERVICE

University-level Service at Penn State University

- Member of the Administrative Council on Undergraduate Education (ACUE), 2023-2024
- Member of the Graduate Council, 2021-2023
- Member of the Inter-College Data Sciences Task Force, 2020-2023

Service in the College of IST at Penn State University

- Member of the DS/AI area tenure/promotion committee, 2024-present
- Associate Dean for Undergraduate Studies, 2023-2024
- Member of the Undergraduate Advisory Committee, 2018-2023
- Program Coordinator of Data Sciences Program in the College of IST, 2019-2023
- Chair of the Human-Centered AI tenure-track faculty search committee, 2022-2023
- Member of the Fixed-term Faculty Promotion Committee, 2019-2023
- Chair of DS 220 Course Committee, 2020-2023
- Chair of the DS/AI tenure-track faculty search committee, 2021-2022
- Member of the Graduate Recruiting Committee, 2019-2021
- Member of the Institute for Computational and Data Sciences (ICDS) Coordination Committee, 2019-2021
- Advisory Committee Member of the Center for Immersive Experience, 2019-2021
- Coordinator of IST Distinguished Lecture Series, 2018-2021
- Member of a First-year PhD Qualifying Examination Committee, 2019, 2020, 2021
- Chair of AI tenure-track and AI/DS teaching faculty search committee, 2019-20
- Chair of IST 210 Course Committee, 2019-20
- Member of the ADUGS Search Committee, 2019-20
- Reviewer of IST seed grant proposals, 2019 & 20
- Presenter at IST Parents' Weekend Open House, Oct. 2019 & Oct. 2020
- Panelist and presenter at New Faculty's Orientation, Aug. 2019
- Member of a Finance Manager Staff Search Committee, 2019
- First-year PhD Qualifying Examination Committee, 2019 & 20
- Member of the DS Faculty Search Committee, for ICS co-hire with CoM and HHD, 2018-19
- Member of the Undergraduate Advisory Committee, 2018-19
- Member of the FAR Research Faculty Review Committee, 2018-19

Service at Lehigh University

- Chair of the CSE Publicity and Web Committee, 2017-18
- Member of the Lehigh Bioengineering Faculty Search committee, 2017-18
- Member of the CSE Graduate Admissions Committee, 2006-17
- Advisor for CS majors from Engineering College and Arts & Sciences College, 2012-15
- Advisor for IBE students with CS concentration, 2016-18
- Member of a CSE Faculty Search Committee, 2008-17
- Member of the University Graduate and Research Committee, 2013-16
- Gave short talks on Candidate's day and Engineering Open House day, 2008-16
- Chair of a CSE Department Faculty Search Committee, 2013-14, 2015-16
- Chair of the CSE Department Colloquium Committee, 2011-12
- Member of the CSE Publicity and Web Committee, 2008-11
- Member of the CSE Curriculum Development Committee, 2006-08
- Member of the CSE Community Committee, 2009-11
- Member of the CSE Computer Facilities Committee, 2008-09

Professional Service in Research Community

- Associate Editor for the Medical Image Analysis journal, since 2021.
- Associate Editor for the Computerized Medical Imaging and Graphics journal, since 2021.
- Associate Editor for the Computer Vision and Image Understanding journal, 2014-2023.
- Co-Program Chair for the 2026 Winter Conference on Applications of Computer Vision (WACV).
- Area Chair for the 39th Annual Conference on Neural Information Processing Systems (NeurIPS).
- Co-General Chair for the 2025 Winter Conference on Applications of Computer Vision (WACV).

- Area Chair for the 2024 European Conference on Computer Vision (ECCV).
- Area Chair for the 2024 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR).
- Area Chair for the 2023 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR).
- Co-organizer for the 2nd ICCV Workshop on Computer Vision for Automated Medical Diagnosis (CVAMD), 2023.
- Co-organizer for the 2nd ICCV Workshop on computer vision for Metaverse (cv4metaverse), 2023.
- Co-organizer for the 2nd MICCAI Workshop on Medical Image Learning with Limited and Noisy Data (MILLanD), 2023.
- Co-organizer for the 3rd MICCAI workshop on Data Augmentation, Labeling, and Imperfections (DALI), 2023.
- Invited Panelist at the Annual MICCAI Society WiM (Women in Miccai) Event, speaking about stories of success and challenges aimed for female scientists, September 2022.
- Program Co-Chair and co-organizer for the 2nd MICCAI Workshop on Data Augmentation, Labeling, and Imperfections (DALI), 2022.
- Area Chair for the 2022 Asian Conference on Computer Vision (ACCV).
- Area Chair for 25th International Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2022.
- Area Chair and Session Chair for the 2022 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR).
- Area Chair for the 2022 AAAI Conference on Artificial Intelligence (AAAI).
- Program Co-Chair and co-organizer for the 1st MICCAI Workshop on Data Augmentation, Labeling, and Imperfections (DALI), 2021
- Area Chair for 24th International Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2021.
- Program committee member and co-organizer for 6th IEEE International Workshop on Computer Vision for Microscopy Image Analysis (CVMI), 2021.
- Area Chair for 22nd International Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2019.
- Co-organizer for the Penn State Symposium on Artificial Intelligence, Data Sciences, and Informatics for Precision Health, 2018.
- Handling Editor for the Computers in Biology and Medicine Journal, 2013-2018.
- Panelist and reviewer for proposals submitted to: NIH study section on Small Business: Aging, Auditory, Vision and Low Vision Technologies (NV12) March and November 2023; NIH study section on Imaging Technology Development (ITD) 2022; CRA/CCC Computing Innovation (CI) Fellows program 2021; NIH Imaging Technology Development (ITD) study section 2021; Biotechnology and Biological Sciences Research Council (BBSRC) UK 2019; National Medical Research Council (NMRC) Singapore TDEP panel 2015; NSF-IIS-Human Centered Computing 2010; NSF-IIS-Robust Intelligence 2009; NSF-IIS-Bio 2009; National Institute for Health Research (NIHR) UK NEAT program 2008.
- Regular reviewer for research journals including IEEE Trans. on Pattern Analysis and Machine Intelligence (TPAMI), Medical Image Analysis (MedIA), IEEE Trans. on Medical Imaging (TMI), International Journal of Computer Vision (IJCV), Computer Vision and Image Understanding (CVIU), IEEE Trans. on Image Processing (TIP), and Computerized Medical Imaging and Graphics (CMIG), since 2005.
- Program committee member and reviewer for international conferences: IEEE/CVF Computer Society Conf. on Computer Vision and Pattern Recognition (CVPR), since 2006; International Conf. on Medical Image Computing and Computer-Assisted Intervention (MICCAI), since 2007; International Conf. on Computer Vision (ICCV), since 2005; IEEE International Symposium on Biomedical Imaging (ISBI), since 2008; MICCAI workshop on High Performance Computing (HP-MICCAI), 2010-2014; IEEE International Conf. on Pattern Recognition (ICPR), 2010-2014; International Symposium on Computer-based Medical Systems (CBMS), 2010-2013; ACM Conference on Computer Graphics and Interactive Techniques (SIGGRAPH), 2011-2014; SIGGRAPH-ASIA 2011-2012; International Conf. on Computer Vision Theory and Applications, 2008, 2010; European Conf. on Computer Vision (ECCV), 2010; Asian Conf. on Computer Vision (ACCV), 2010; International Symposium on Visual Computing (ISVC), 2009, 2011; IEEE Computer Society Workshop on Mathematical Methods in Biomedical Image Analysis (MMBIA), 2009; IEEE International Conf. on Advanced Video and Signal Based Surveillance (AVSS), 2008; Graphic Interface 2008; Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR) 2005.

- Session chair and program committee member for 6th International Conference on Functional Imaging and Modeling of the Heart (FIMH), 2011.
- Session chair and program committee member for International Workshop on High-Performance Medical Image Computing for Image-Assisted Clinical Intervention and Decision-Making, 2010.
- Co-chair and co-organizer for “Deformable Models: Theory and Applications,” A Special Track at International Symposium on Visual Computing (ISVC), 2009.