SMI2026

SMI 2026 Program Book

Track A · S1 | 8:00–9:20 AM, June 1 | Michigan Room, 2nd floor

Scalable, Interpretable, and Reproducible Methods for Neuroimaging Analysis

Yuliang Xu	*Bayesian Image Regression with Soft-thresholded Conditional Autoregressive Prior*
Luling Altan	*Alzheimer's Disease Subtype Identification from Spatial Tau-PET Heterogeneity Using Self-Supervised Deep Learning*
Emily Hector	*A new block covariance regression model and inferential framework for massively large neuroimaging data*
Paul Taylor	*Go Figure: Transparency in neuroscience images preserves context and clarifies interpretation*

Track B · S2 | 8:00–9:20 AM, June 1 | Hussey Room, 2nd floor

Advances in methods for cancer imaging: From single-cell data to sustainable AI

Inna Chervoneva	*Spatial index biomarkers based on quantitative single-cell protein expression imaging data*
Lubomir Hadjiski	*Integrated approach: Large language models, deep learning and radiomics for survival prediction of bladder cancer patients*
Andrew Whiteman	*Using computer vision-inspired kernels to predict cancer prognosis from multiplexed images of tumor micro-environments*
Shu (Joy) Jiang	*Sustainable AI in cancer imaging: From research to market*

Track A · S3 | 9:30–10:50 AM, June 1 | Michigan Room, 2nd floor

AI for Medical Image Analysis I

Xiaoxing Ren	*A Communication-Efficient Decentralized Learning Algorithm for Multi-Center Medical Image Classification*
John Reavey-Cantwell & Emily Wittrup	*An Integrative AI Method for Stroke Treatment Assessment and Management*
Amoon Jamzad	*Multimodal Intraoperative Margin Assessment in Breast Conserving Surgery*
Robert Policelli	*A pathway-based approach to improve breast cancer classification explainability*

Track B · S4 | 9:30–10:50 AM, June 1 | Hussey Room, 2nd floor

Statistical Innovation in Multiplex Imaging: Methods for Robust Discovery

Thao Vu	*Spatial and functional analytic approaches for single-cell imaging data using entropy measures*
Souvik Seal	*SpaceBF: Spatial coexpression analysis using Bayesian Fused approaches in spatial omics datasets*
Siyuan Ma	*Batch-Agnostic Self-Supervised Learning Uncovers Clinically Relevant Tumor Niches in Multiplexed Imaging*
Ruoqian Liu	*Detecting Disease-Associated Dysbiosis in Image-Based Spatial Microbiome Data*

Track C · S5 | 9:30–10:50 AM, June 1 | Room 4, 1st floor

Alignment, Calibration, and Robust Inference in Neuroimaging

Zhengwu Zhang	*Alignment of Continuous Brain Connectivity*
Yiwen Dong	*Alzheimer's Disease Biomarkers Harmonization Challenges*
Andrew Chen	*Calibration of MRI-Based Reference Intervals to New Samples*
Xinyu Zhang	*Asymptotic Distribution of Robust Effect Size Index*

11:15 AM–12:15 PM, June 1 | Michigan League Ballroom, 2nd floor

Keynote Presentation #1

Hernando Ombao	*Spectral Measures of Brain Functional Connectivity*

Track A · S6 | 1:30–2:50 PM, June 1 | Michigan Room, 2nd floor

Spatiotemporal Models for Brain Structure, Function, and Connectivity

Mara Sherlin Talento	*KenCoh: A Rank-Based Estimator of Coherence between Multivariate Time Series*
Yuhyeong Jang	*A Survival Analysis of Glioma Patients using Topological Features*
Heather Shappell	*A Hidden Semi-Markov Model Framework for Covariate-Dependent Sojourn Distributions in Dynamic Brain Network Analysis*
Joshua Lukemire	*Hierarchical Modeling of Localized Intracranial Volume Abnormalities in Craniosynostosis*

Track B · S7 | 1:30–2:50 PM, June 1 | Hussey Room, 2nd floor

Advanced Statistical and Machine Learning based methods for Spatial imaging and omics

Satwik Acharyya	*Network models for Spatial omics data*
Ronglai Shen	*Spatial Immunophenotyping from Whole-Slide Multiplexed Tissue Imaging using Convolutional Neural Networks*
Michele Peruzzi	*Integrated Geospatial Network models for Spatial Omics*
Veera Baladandayuthapani	*Bayesian Statistical Models for Spatial Imaging in Cancer*

Track C · S8 | 1:30–2:50 PM, June 1 | Room 4, 1st floor

Principled Statistical and Machine Learning Methods for Brain Imaging Inference

Benjamin Risk	*Causal inference for hierarchical machine learning with an application to stimulant impacts on brain connectivity in autism*
Armin Iraji	*From Signals to Sources: Advances in Dynamic Precision Functional Mapping*
Guorong Wu	*Uncover Governing Law of Pathology Propagation Mechanism Through A Mean-Field Game*
Will Consagra	*Learned Hemodynamic Coupling Inference in Resting-State Functional MRI*

Track A · S9 | 3:00–4:20 PM, June 1 | Michigan Room, 2nd floor

Advanced statistical and AI models for complex and graphical brain images

Yuexuan Wu	*High-Dimensional Multivariate Mediation Analysis for Brain Imaging via Structured Dimension Reduction*
Zhihao Wu	*Dependence-Aware Knockoff Enables Stable Feature Discovery in Brain Imaging*
Qiong Wu	*Distributed Covariance Graph-Guided ComBat (dG-ComBat): A Privacy-Preserving Framework for Harmonizing Multi-Site Neuroimaging Data*
Xinyuan Tian	*Estimating a shared backbone linking structural and functional connectomes via bidirectional graph autoencoders*

Track B · S10 | 3:00–4:20 PM, June 1 | Hussey Room, 2nd floor

Emerging Statistical Techniques for Longitudinal and Multimodal Imaging Analysis

Ivo Dinov	*Kime-Phase Tomography and Manifold Representation of Longitudinal Processes over a Complex-Time Domain*
Rajarshi Guhaniyogi	*DeepSpFactor: A Statistically Trustworthy Deep Learning Framework for Spatial Factor Models in Multi-subject Multi-modal Imaging*
Simon Vandekar	*Semiparametric confidence sets for a robust effect size in Neuroimaging*
Sharmistha Guha	*Multimodal Neuroimaging in Aging: Joint Learning of Network Data and Spatially Correlated Node Attributes*

Track C · S11 | 3:00–4:20 PM, June 1 | Room 4, 1st floor

Modern Statistical Methods for Neuroimaging

John Kornak	*An MCMC Approach to Bayesian Image Analysis in Fourier Space*
Moo Kyung Chung	*Causality without DAG*
Dayu Sun	*Sparse Partial Generalized Tensor Regression With Application to Neuroimaging Data*
Gang Chen	*Navigating Correlation, Causation, and Interpretation in Resting-State fMRI*

4:30–6:30 PM, June 1 | Various Locations

Training Tutorials & Short Courses

Empowering Large Language Models with Statistics: A Practical Tutorial for Medical Imaging
Khashayar Namdar & Pascal Tyrrell | *Michigan League Ballroom, 2nd floor*

Manifold learning and dimension reduction for imaging data
Chunming Zhang | *Hussey Room, 2nd floor*

Methods for FMRI processing, quality control and group analysis in AFNI
Paul Taylor & Gang Chen | *Michigan Room, 2nd floor*

Introduction to P300 Brain-Computer Interface Data Analysis Challenges
Jane Huggins | *Room 4, 1st floor*

Track A · S12 | 8:00–9:20 AM, June 2 | Michigan Room, 2nd floor

Methods for Statistical Imaging Data with Applications to Physical Sciences

David van Dyk	*Identification of high-energy astrophysical point sources via hierarchical Bayesian nonparametric clustering*
Hengrui Luo	*Bayesian Partition-Based Scalar-on-Image Regression with Group Spike-and-Slab Priors*
Jeffrey Regier	*Expectation-Maximization with Dual-Stream Flow Matching for Cataloging Astronomical Images*
Rachel Mandelbaum	*Precise estimation of weak gravitational lensing distortions from images*

Track B · S13 | 8:00–9:20 AM, June 2 | Hussey Room, 2nd floor

From Connections to Understanding: Brain Network Models in Neuroscience

Yi Zhao	*Estimation of Heterogeneous Causal Mediation Effects*
Yize Zhao	*Bayesian graph-informed modeling for Tau-connectivity interaction*
Mohsen Bahrami	*Brain Networks: Multivariate Statistical Tools to Study Structure, Function, and Dynamics*
Noah Gade	*Segmentation in Dynamic Neuroimaging via Random Featurizations*

Track C · S14 | 8:00–9:20 AM, June 2 | Room 4, 1st floor

Advanced Statistical Modeling and Machine Learning for Brain Imaging Data

Aiying Zhang	*ConnectMVR: A Supervised Brain Connectivity Analysis Framework for Predicting Behavioral Outcomes*
Shuo Chen	*Trustworthy ML/AI for Aging Clocks: Preventing Systematic Prediction Bias in Biological Age Estimation*
Yuan Wang	*Topological Inference and Clustering of Functional Brain Networks*
Ruiwen Zhou	*A Temporal Graph Neural Network for Time-to-Alzheimer's Disease Prediction Using Longitudinal Neuroimaging Data*

Track A · S15 | 9:30–10:50 AM, June 2 | Michigan Room, 2nd floor

Statistical Method for Interpreting Astronomical Images

Kevin McKinnon	*Measuring precise motions of the faintest stars by combining Hubble, James Webb, and Gaia*
Tamás Budavári	*Towards Cleaner and Deeper Sky Reconstructions from Astronomy Exposures: ImageMM and Beyond*
Andrew Saydjari	*Separating Stars and the Diffuse Sky: Leveraging Thermal Light Echoes for 3D Tomography*
Yang Chen	*Probabilistic Tensor Prediction for High-Dimensional Solar Imaging Data*

Track B · S16 | 9:30–10:50 AM, June 2 | Hussey Room, 2nd floor

Statistical and AI Methods for Heterogeneous and Irregular Imaging Data

Haochang Shou	*Adaptive Shrinkage Estimation for Personalized Deep Kernel Regression in Modeling Brain Trajectories*
Liyue Shen	*Constrained and Controllable Diffusion Models for Computational Imaging*
Christopher Geoga	*Sharpening and accelerating Fourier methods for irregularly sampled measurements*
John Bodenschatz	*Mathematically Accurate Maximum Likelihood Estimation Detects Activation in FMRI Phase Data from Local Magnetic Field Changes*

Track C · S17 | 9:30–10:50 AM, June 2 | Room 4, 1st floor

Achieving Reliable Inference and Prediction from Noisy Imaging Data through Structure Learning

Fangyi Wang	*Joint Registration and Conformal Prediction for Partially Observed Functional Data*
Megan Jones	*Estimation of Maximum Achievable Predictive Accuracy for Machine Learning Brain-Phenotype Associations*
Yezhi Pan	*Network-Guided Multivariate Regression for High-dimensional Imaging Outcomes*
Jiaao Yu	*Structured multi-modal imaging interaction discovery with a triple-graph mode*

11:15 AM–12:15 PM, June 2 | Michigan League Ballroom, 2nd floor

Keynote Presentation #2

Nicole Lazar	*On the Replicability of Functional Brain Networks*

Track A · S18 | 1:30–2:50 PM, June 2 | Michigan Room, 2nd floor

Recent Advances in Complex Modeling of Brain Imaging and Networks

Panpan Zhang	*Group-Structured Sparse Precision Estimation for Interpretable Functional Brain Networks*
Marina Vannucci	*Bayesian Brain Network Mediation Analysis of Longitudinal Alzheimer's Disease Data*
Suprateek Kundu	*Bayesian Semi-parametric Tensor-on-Tensor Regression for Forecasting Alzheimer's Disease Progression*
Yu-Ping Wang	*Nonlinear mixed models for brain network analysis based on Multi-Paradigm fMRIs*

Track B · S19 | 1:30–2:50 PM, June 2 | Hussey Room, 2nd floor

Next-Generation Statistical and Inferential Methods for Neuroimaging and Multimodal Data Integration

Zhirui Li & Bingxin Zhao	*Agentic AI in imaging genetics*
Jeffery Morris	*Scalable distributional regression*
Quy Cao	*Spatial Bootstrap for Voxel-Wise Neuroimaging Analysis*
Noah Hillman	*Testing for Network Specificity in Brain-Behavior Associations Using Ordinal Dominance Curves*

Track C · S20 | 1:30–2:50 PM, June 2 | Room 4, 1st floor

AI for Medical Image Analysis II

Morgen Henry	*A Four-Stage Statistical Pipeline for Medical Image Super-Resolution via Generative Adversarial Learning*
Khashayar Namdar	*RadiomiXAI: adjusting radiomics feature importance via Bayesian Network-guided explainability*
Amoon Jamzad	*Spatial Prompting for Representation and Exploration of High-Dimensional Data*

Track A · S21 | 3:00–4:20 PM, June 2 | Michigan Room, 2nd floor

Recent advancements in statistical methods for MRI

Seonjoo Lee	*Model Selection for Exposure-Mediator Interaction for high-dimensional imaging mediators*
Chao Huang	*Dynamic Mediation Analysis*
Kaidi Kang	*Characterizing Longitudinal Trajectories of Structural MRI–derived Biomarkers Toward Alzheimer's Disease Progression Using a Double anchoring events–based Sigmoidal Mixed Model*
Jun Young Park	*Statistical considerations in intermodal coupling analysis*

Track B · S22 | 3:00–4:20 PM, June 2 | Hussey Room, 2nd floor

Statistical Network Analysis for Neuroimaging

Liza Levina	*Comparing groups of networks*
Jaroslaw Harezlak	*Simultaneous Nuclear Norm and L_1 Regularization for Binary-outcome-on-Matrix Regression with Applications to Brain Imaging*
Keith Levin	*Estimating Multiple Weighted Networks with Node-Sparse Differences and Shared Low-Rank Structure*
Braden Scherting	*Quasi-Poisson multiplex ANOVA with applications to brain connectors*

Track C · S23 | 3:00–4:20 PM, June 2 | Room 4, 1st floor

Recent developments on neuroimage analyses for use in digital twins

Siddhartha Nandy	*Spatio-temporal modeling of neuroimages using Covariate Assisted Principal Regression*
Ansu Chatterjee	*Rapid change detection in streaming neuroimage data*
Sanjay Chaudhuri	*An empirical likelihood-based method for functional neuroimaging*

4:30–6:30 PM, June 2 | Michigan League Ballroom, 2nd floor

Posters and Mixer Event

P2 | Haozheng Xu	*A Curated Meta-analytic Neuroimaging Dataset from Neurovault*
P3 | Chen Mu	*Statistical Analysis and Characterization of Gold Nanoparticle Morphology from Tomographic Image Stacks*
P4 | Pascal Tyrrell	*Restoring Radiomic Feature Interpretability After Principal Component Analysis in Prostate MRI Cancer Risk Models*
P5 | Khashayar Namdar	*AI-Powered Endometriosis MRI Reporting: Automated #Enzian Scoring in Pelvic MRI Enabled by Large Language Models*
P7 | Susan Glenn	*Bootstrap-based Hypothesis Test of 2D Contours using Elastic Shape Analysis*
P8 | Robert J Bishop	*JointSpace and Operating Rhythms*
P9 | Stefan Eng	*Modeling Differences in Tumor-Immune Co-Localization to Predict Immune Checkpoint Inhibitor Response in Metastatic NSCLC*
P10 | Xiaoyu Qiu	*Benchmarking Uncertainty Quantification of Plug-and-Play Diffusion Priors for Inverse Problems Solving*
P11 | Martin Salgado-Flores	*Relational Persistent Homology of the Tumor Microenvironment for Survival Analysis of Lung Adenocarcinoma*
P12 | Shashipraba Rajakaruna	*Topology guided conditional generative adversarial network for medical image simulation*
P13 | Sanya Kejriwal	*Evaluating the Performance of the SPICE Test Under Heterogeneous Spatial Autocorrelation*

4:30–6:30 PM, June 2 | Michigan League Ballroom, 2nd floor

Posters and Mixer Event (continued)

P14 | Jessica Aldous	*MoSAIC: Multi-Resolution Spatial Regression Analysis of Cellular Colocalizations in Cancer Imaging*
P15 | Zihang Wang	*Flexible Normative Brain Modeling Using Quantile Super Learning with Motion Control*
P16 | Yuting Duan	*Robust Image-on-scalar Regression with Simultaneous Activation Region and Extreme Signal Detection*
P17 | Yuhan Geng	*Threshold Spatial Attention Transformer for Efficient Image Generation*
P18 | Yiyan Hao	*Applying Multiple Imputation On Neuroimaging Data While Maintaining Spatial Autocorrelation*
P19 | Rosa Fallahpour	*A Spatial Entropy Framework for Characterizing Radiomic Heterogeneity: Application to Healthy and Pediatric Tumor Brain MRI*
P20 | John Bodenschatz	*Distributionally Accurate Phase Activation in FMRI*
P21 | Ziyu Liu	*Bayesian Image-on-Image Regression for Linking Resting-State Connectivity to Task fMRI Activation*
P22 | Longhao Pang	*Bayesian Joint Singular Value Decomposition with Application to Image Analysis*
P23 | Yuxiao Nie	*Sparse Dynamic Latent Factor Models for Multi-Channel EEG based Brain Computer Interfaces*
P24 | Grant Carr	*SPARCL: Spatially Adaptive Regression for Covariate Driven Clustering*
P25 | Razmin Bari	*Extracting Bipolar-Associated Functional Connectivity Subgraphs in Adolescent rs-fMRI Using Adaptive Dense Subgraph Discovery*
P26 | Siyan Wen	*Out-of-Sample CovBat for Multi-Site Harmonization of Resting-State Functional Connectivity*
P27 | Mara Sherlin Talento	*KenCoh: A Rank-Based Estimator of Canonical Coherence*
P28 | Frank Fazekas	*Centrosome Positioning and Nuclear Architecture: Implications for T Cell Activation*

4:30–6:30 PM, June 2 | Michigan League Ballroom, 2nd floor

Posters and Mixer Event (continued)

P29 | Minjin Lee	*Monte Carlo–Based Assessment and Spatial Smoothing for CTRW Parameter Estimation in DWI*
P30 | Ralph Jiang	*Scalable Image-on-Scalar Regression for High-Dimensional Neuroimaging Data*

Track A · S24 | 8:00–9:20 AM, June 3 | Michigan Room, 2nd floor

Network methods in neuroimaging

Tingting Zhang	*Age-Related Changes in Structural Networks Across Large Neuroimaging Studies*
Russel T. Shinohara	*Multi-Site Harmonization Methods for Network-based Analyses*
Daniel Kessler	*Predicting Responses from Weighted Networks with Node Covariates in an Application to Neuroimaging*
Alexander Huth	*Mapping and Decoding Language Representations from Human Cortex*

Track B · S25 | 8:00–9:20 AM, June 3 | Hussey Room, 2nd floor

AI for Medical Image Analysis III

Pascal Tyrrell	*Restoring Radiomic Feature Interpretability After Principal Component Analysis in Prostate MRI Cancer Risk Models*
Daljit Takher	*Physics-Learning of Rotor Dynamics: A Reaction-Diffusion Video Prediction Framework for Cardiac Fibrillation*

9:30–10:50 AM, June 3 | Michigan League Ballroom, 2nd floor

Student Paper Session: Theory & Methods

Zhenyao Ye (Winner)	*Graph guided polygenic–pleiotropic architecture analysis for imaging-genetics data*
Guoxuan Ma (Runner-up)	*Sparse Bayesian modeling of EEG channel interactions improves P300 brain-computer interface performance*

Student Paper Session: Case Studies & Applications

Yuzi Mi (Winner)	*Bayesian functional spatial partitioning for boundary surface lesion detection using 3D MRI*
Noah Hillman (Runner-up)	*Testing for network specificity in brain-behavior associations using ordinal dominance curves*

11:15 AM–12:15 PM, June 3 | Michigan League Ballroom, 2nd floor

Keynote Presentation #3

Douglas Noll	*Spatiotemporal signal modeling in dynamic MRI*

Scan the QR code to access the Statistical Methods in Imaging (SMI) 2026 website