

1. Record Nr.	UNINA9910485594103321
Titolo	Information processing in medical imaging : 27th International Conference, IPMI 2021, Virtual event, June 28-June 30, 2021, Proceedings // Editor, Aasa Feragen [and three others]
Pubbl/distr/stampa	Cham, Switzerland : , : Springer, , [2021] ©2021
ISBN	3-030-78191-7
Descrizione fisica	1 online resource (784 pages)
Collana	Lecture Notes in Computer Science ; ; v.12729
Disciplina	006.6
Soggetti	Diagnostic imaging - Data processing
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Intro -- Preface -- Organization -- Contents -- Registration -- HyperMorph: Amortized Hyperparameter Learning for Image Registration -- 1 Introduction -- 2 Related Work -- 3 Methods -- 3.1 HyperMorph -- 3.2 Hyperparameter Tuning -- 3.3 Implementation -- 4 Experiments -- 4.1 Experiment 1: HyperMorph Efficiency and Capacity -- 4.2 Experiment 2: Robustness to Initialization -- 4.3 Experiment 3: Hyperparameter-Tuning Utility -- 5 Conclusion -- References -- Deep Learning Based Geometric Registration for Medical Images: How Accurate Can We Get Without Visual Features? -- 1 Introduction -- 1.1 Related Work -- 1.2 Contribution -- 2 Methods -- 2.1 Loopy Belief Propagation for Regularised Registration of Keypoint Graphs -- 2.2 Geometric Feature Extraction with Graph Convolutional Neural Networks -- 2.3 Deep Learning Based End-to-End Geometric Registration Framework -- 2.4 Implementation Details: Keypoints, Visual Features and Integral Loss -- 3 Experiments and Results -- 4 Discussion and Conclusion -- References -- Diffeomorphic Registration with Density Changes for the Analysis of Imbalanced Shapes -- 1 Introduction -- 2 Diffeomorphic Registration of Geometric Measures -- 2.1 Diffeomorphisms and Registration -- 2.2 Geometric Measure Representation of Shapes -- 3 Diffeomorphic Registration with Density Changes -- 3.1 An Augmented Optimal Control Problem -- 3.2 Numerical Implementation -- 3.3 Local Density Changes -- 4 Results

-- 5 Conclusion -- References -- Causal Models and Interpretability -- Estimation of Causal Effects in the Presence of Unobserved Confounding in the Alzheimer's Continuum -- 1 Introduction -- 2 Methods -- 2.1 The Causal Question and Its Associated Graph -- 2.2 Identifiability in the Presence of an Unobserved Confounder -- 2.3 Estimating a Substitute Confounder -- 2.4 Identifiability in the Presence of a Substitute Confounder. 2.5 The Outcome Model -- 3 Experiments -- 4 Conclusion -- References -- Multiple-Shooting Adjoint Method for Whole-Brain Dynamic Causal Modeling -- 1 Introduction -- 2 Methods -- 2.1 Notations and Formulation of Problem -- 2.2 Multiple-Shooting Method -- 2.3 Adjoint State Method -- 2.4 Multiple-Shooting Adjoint (MSA) Method -- 2.5 Dynamic Causal Modeling -- 3 Experiments -- 3.1 Validation on Toy Examples -- 3.2 Application to Whole-Brain Dynamic Causal Modeling with fMRI -- 4 Conclusion -- References -- Going Beyond Saliency Maps: Training Deep Models to Interpret Deep Models -- 1 Introduction -- 2 Related Work -- 3 Methods -- 3.1 Cycle-Consistent Image Simulation -- 3.2 Coupling Simulators via Conditional Convolution -- 3.3 Learning Warping Fields -- 4 Experiments -- 4.1 Synthetic Experiments -- 4.2 Visualizing the Effect of Alzheimer's Disease -- 4.3 Visualizing the Effect of Alcohol Dependence -- 5 Conclusion -- References -- Generative Modelling -- Enabling Data Diversity: Efficient Automatic Augmentation via Regularized Adversarial Training -- 1 Introduction -- 2 Related Work -- 3 Method -- 3.1 Preliminaries -- 3.2 Regularized Adversarial Data Augmentation -- 3.3 Data Augmentation Space and Models -- 4 Experiments -- 4.1 Experiments Setup -- 4.2 Skin Lesion Diagnosis Result -- 4.3 Organ-at-Risk Segmentation Result -- 5 Conclusion -- References -- Blind Stain Separation Using Model-Aware Generative Learning and Its Applications on Fluorescence Microscopy Images -- 1 Introduction -- 2 Methodology -- 3 Fluorescence Unmixing -- 4 Experimental Evaluation -- 4.1 Experimental Setup -- 4.2 Results and Discussions -- 5 Conclusions -- References -- MR Slice Profile Estimation by Learning to Match Internal Patch Distributions -- 1 Introduction -- 2 Methods -- 2.1 Slice Profile -- 2.2 Slice Profile and Internal Patch Distributions. 2.3 Slice Profile and GAN -- 2.4 Regularization Functions and Other Details -- 3 Experiments and Results -- 3.1 Simulations from Isotropic Images -- 3.2 Incorporating Slice Profile Estimation into SMORE -- 3.3 Measuring Through-Plane Resolution After Applying SMORE -- 4 Discussion and Conclusions -- References -- Shape -- Partial Matching in the Space of Varifolds -- 1 Introduction -- 2 Partial Matching -- 2.1 The Varifold Framework for Shape Matching -- 2.2 Definition of the Partial Matching Dissimilarity -- 2.3 Normalized Partial Matching Dissimilarity -- 2.4 Use in the LDDMM Setting -- 3 Experiments -- 4 Conclusion -- References -- Nested Grassmanns for Dimensionality Reduction with Applications to Shape Analysis -- 1 Introduction -- 2 Nested Grassmannians -- 2.1 The Riemannian Geometry of Grassmann Manifolds -- 2.2 Embedding of $Gr(p, m)$ in $Gr(p, n)$ -- 2.3 Unsupervised Dimensionality Reduction -- 2.4 Supervised Dimensionality Reduction -- 2.5 Choice of the Distance d -- 2.6 Analysis of Principal Nested Grassmanns -- 3 Experiments -- 3.1 Synthetic Data -- 3.2 Application to Planar Shape Analysis -- 4 Conclusion -- References -- Hierarchical Morphology-Guided Tooth Instance Segmentation from CBCT Images -- 1 Introduction -- 2 Methods -- 2.1 Tooth Centroid and Skeleton Extraction Network -- 2.2 Multi-task Learning for Tooth Segmentation -- 2.3 Implementation Details -- 3 Experimental Results -- 3.1 Dataset and Evaluation Metrics -- 3.2 Evaluation and Comparison -- 3.3

Comparison with the State-of-the-Art Methods -- 4 Conclusion --
References -- Cortical Morphometry Analysis Based on Worst
Transportation Theory -- 1 Introduction -- 2 Theoretic Results -- 2.1
Optimal Transportation Map -- 2.2 Worst Transportation Map -- 2.3
Geometric Variational Method -- 3 Computational Algorithms -- 3.1
Basic Concepts from Computational Geometry.
3.2 Algorithms Based on Computational Geometry -- 4 Experiments --
5 Conclusion -- References -- Geodesic B-score for Improved
Assessment of Knee Osteoarthritis -- 1 Introduction -- 2 Background
-- 2.1 Shape Space -- 2.2 Geometric Statistics -- 3 Geodesic B-score
-- 3.1 Generalization -- 3.2 Sex-Specific Reference -- 3.3 Algorithmic
Treatment -- 4 Results and Discussion -- 4.1 Data Description -- 4.2
Efficiency of Projection Algorithm -- 4.3 Predictive Validity -- 5
Conclusion and Future Work -- References -- Brain Connectivity --
Cytoarchitecture Measurements in Brain Gray Matter Using Likelihood-
Free Inference -- 1 Introduction -- 2 Methods -- 2.1 Modeling the
Brain Gray Matter with a 3-Compartment Model -- 2.2 An Invertible 3-
Compartment Model: dMRI Summary Statistics -- 2.3 Solving the
Inverse Problem via Likelihood Free Inference -- 3 Results and
Discussion -- 3.1 Simulations -- 3.2 HCP MGH Results -- 4 Conclusion
-- References -- Non-isomorphic Inter-modality Graph Alignment and
Synthesis for Holistic Brain Mapping -- 1 Introduction -- 2
Methodology -- 3 Experimental Results and Discussion -- 4
Conclusion -- References -- Knowledge Transfer for Few-Shot
Segmentation of Novel White Matter Tracts -- 1 Introduction -- 2
Methods -- 2.1 Problem Formulation and Classic Fine-Tuning -- 2.2
Knowledge Transfer for Few-Shot Segmentation of Novel WM Tracts --
2.3 A Better Implementation with Warmup -- 2.4 Implementation
Details -- 3 Results -- 3.1 Data Description and Experimental Settings
-- 3.2 Evaluation of Segmentation Accuracy -- 3.3 Impact of the
Number of Annotated Training Scans -- 3.4 Evaluation of Volume
Difference -- 4 Discussion -- 5 Conclusion -- References --
Discovering Spreading Pathways of Neuropathological Events
in Alzheimer's Disease Using Harmonic Wavelets -- 1 Introduction -- 2
Methods -- 2.1 Manifold Harmonics.
2.2 Construction of Region-Adaptive Harmonic Wavelets -- 3
Experiments -- 3.1 Evaluate the Representation Power on Harmonic
Wavelets -- 3.2 Evaluate the Statistic Power of Harmonic Wavelet
Fingerprint -- 4 Conclusions -- References -- A Multi-scale Spatial and
Temporal Attention Network on Dynamic Connectivity to Localize the
Eloquent Cortex in Brain Tumor Patients -- 1 Introduction -- 2 A Multi-
scale Spatial and Temporal Attention Network to Localize the Eloquent
Cortex -- 2.1 Input Dynamic Connectivity Matrices -- 2.2 Multi-scale
Spatial Attention on Convolutional Features -- 2.3 Temporal Attention
Model and Multi-task Learning -- 3 Experimental Results -- 3.1
Dataset and Preprocessing -- 3.2 Localization Results -- 3.3 Feature
Analysis -- 4 Conclusion -- References -- Learning Multi-resolution
Graph Edge Embedding for Discovering Brain Network Dysfunction in
Neurological Disorders -- 1 Introduction -- 1.1 Related Work -- 2
Proposed Method -- 2.1 Multi-resolution Graph Edge Transform -- 2.2
Efficient Graph Matrix Transform -- 2.3 Network Architecture -- 2.4
Training MENET -- 3 Experiments -- 3.1 Datasets -- 3.2 Experimental
Settings -- 3.3 Structural Brain Connectivity Analysis on ADNI -- 3.4
Functional Brain Connectivity Analysis on ADHD -- 3.5 Discussions on
Convergence of Scales -- 4 Conclusion -- References -- Equivariant
Spherical Deconvolution: Learning Sparse Orientation Distribution
Functions from Spherical Data -- 1 Introduction -- 2 Methods -- 2.1
Background and Preliminaries -- 2.2 Equivariant Spherical

Deconvolution -- 3 Experiments -- 3.1 Noisy Synthetic Benchmark --
3.2 The Tractometer Benchmark -- 3.3 Real-World Multi-shell Human
Dataset -- 4 Discussion -- References -- Geodesic Tubes for
Uncertainty Quantification in Diffusion MRI -- 1 Introduction -- 2
Theory -- 3 Experiments -- 4 Discussion -- References.
Structural Connectome Atlas Construction in the Space of Riemannian
Metrics.
