

1. Record Nr.	UNINA9910484561103321
Titolo	Deep Learning in Medical Image Analysis and Multimodal Learning for Clinical Decision Support [[electronic resource] ] : Third International Workshop, DLMIA 2017, and 7th International Workshop, ML-CDS 2017, Held in Conjunction with MICCAI 2017, Québec City, QC, Canada, September 14, Proceedings // edited by M. Jorge Cardoso, Tal Arbel, Gustavo Carneiro, Tanveer Syeda-Mahmood, João Manuel R.S. Tavares, Mehdi Moradi, Andrew Bradley, Hayit Greenspan, João Paulo Papa, Anant Madabhushi, Jacinto C. Nascimento, Jaime S. Cardoso, Vasileios Belagiannis, Zhi Lu
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2017
ISBN	3-319-67558-3
Edizione	[1st ed. 2017.]
Descrizione fisica	1 online resource (XIX, 385 p. 169 illus.)
Collana	Image Processing, Computer Vision, Pattern Recognition, and Graphics ; ; 10553
Disciplina	006.42
Soggetti	Optical data processing Artificial intelligence Health informatics Bioinformatics Logic design Image Processing and Computer Vision Artificial Intelligence Health Informatics Computational Biology/Bioinformatics Logic Design
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Workshop Editors -- Preface DLMIA 2017 -- Organization -- Preface ML-CDS 2017 -- Organization -- Contents -- Third International Workshop on Deep Learning in Medical Image Analysis, DLMIA 2017 -- Simultaneous Multiple Surface Segmentation Using Deep Learning -- 1 Introduction -- 2 Method -- 3 Experiments -- 4

Results -- 5 Discussion and Conclusion -- References -- A Deep Residual Inception Network for HEp-2 Cell Classification -- Abstract -- 1 Introduction -- 2 Deep Residual Inception -- 2.1 Network Architecture -- 2.2 DRI Module -- 2.3 Network Training -- 3 Results -- 3.1 Dataset -- 3.2 Data Augmentation -- 3.3 Performance Analysis -- 3.4 Comparisons -- 4 Conclusion -- References -- Joint Segmentation of Multiple Thoracic Organs in CT Images with Two Collaborative Deep Architectures -- 1 Introduction -- 2 Method -- 2.1 SharpMask Feature Fusion Architecture and CRF Refinement -- 2.2 Learning Anatomical Constraints -- 3 Experiments -- 3.1 Dataset and Pre-processing -- 3.2 Training -- 3.3 Results -- 4 Conclusions -- References -- Accelerated Magnetic Resonance Imaging by Adversarial Neural Network -- 1 Introduction -- 2 Method -- 2.1 K-space -- 2.2 Objective -- 2.3 Network Architecture -- 3 Experimental Results -- 4 Conclusions -- References -- Left Atrium Segmentation in CT Volumes with Fully Convolutional Networks -- 1 Introduction -- 2 Related Work -- 3 Method -- 3.1 Preprocessing -- 3.2 Fully Convolutional Network -- 3.3 Shape Constraints -- 4 Experiments -- 5 Conclusion -- References -- 3D Randomized Connection Network with Graph-Based Inference -- 1 Introduction -- 2 Methodology -- 2.1 Convolutional LSTM and 3D Convolution -- 2.2 Randomized Connection Network -- 2.3 Graph-Based Inference -- 3 Experiment -- 4 Conclusion -- References -- Adversarial Training and Dilated Convolutions for Brain MRI Segmentation -- 1 Introduction. 2 Materials and Methods -- 2.1 Data -- 2.2 Network Architecture -- 2.3 Adversarial Training -- 3 Experiments and Results -- 3.1 Experiments -- 3.2 Evaluation -- 4 Discussion and Conclusions -- References -- CNNs Enable Accurate and Fast Segmentation of Drusen in Optical Coherence Tomography -- 1 Introduction -- 2 Related Work -- 3 Method -- 3.1 Data Preparation -- 3.2 Network Architecture and Training -- 3.3 Three Approaches to Drusen Segmentation -- 4 Experiments and Results -- 4.1 Cross-Validation Setup -- 4.2 Quantitative Evaluation -- 4.3 Robustness to Additional Pathology -- 4.4 3D Visualization of Results -- 5 Conclusion -- References -- Region-Aware Deep Localization Framework for Cervical Vertebrae in X-Ray Images -- 1 Introduction -- 2 Data -- 3 Methodology -- 3.1 Localization Ground Truth -- 3.2 Network Architectures -- 3.3 Training -- 3.4 Region-Aware Term -- 3.5 Updated Loss Function -- 3.6 Experiments and Inference -- 4 Results and Discussions -- 5 Conclusion -- References -- Domain-Adversarial Neural Networks to Address the Appearance Variability of Histopathology Images -- 1 Introduction -- 2 Materials and Methods -- 2.1 Datasets -- 2.2 The Underlying CNN Architecture -- 2.3 Three Approaches to Handling Appearance Variability -- 2.4 Evaluation -- 3 Experiments and Results -- 4 Discussion and Conclusions -- References -- Accurate Lung Segmentation via Network-Wise Training of Convolutional Networks -- 1 Introduction -- 2 Methods -- 2.1 Lung Segmentation with Atrous Convolutions -- 2.2 Network-Wise Training of CNN -- 3 Computational Experiments -- 3.1 Performance Metrics -- 3.2 Quantitative and Qualitative Results -- 4 Conclusion -- References -- Deep Residual Recurrent Neural Networks for Characterisation of Cardiac Cycle Phase from Echocardiograms -- 1 Introduction -- 2 Methods -- 2.1 Dataset. 2.2 Deep Residual Recurrent Neural Networks (RRNs) -- 3 Experiments -- 4 Results and Discussion -- 5 Conclusion and Future Works -- References -- Computationally Efficient Cardiac Views Projection Using 3D Convolutional Neural Networks -- 1 Introduction -- 2 Methods -- 3 Results -- 4 Conclusion -- References -- Non-rigid Craniofacial 2D-3D Registration Using CNN-Based Regression -- 1 Introduction -- 2

Methods -- 2.1 Regression-Based 2D-3D Registration -- 2.2 CNN Based Regressor -- 3 Experiments -- 3.1 Qualitative Assessment -- 4 Conclusion -- References -- A Deep Level Set Method for Image Segmentation -- 1 Introduction -- 2 Methods -- 2.1 The Level Set Method -- 2.2 The Integrated FCN-Levelset Model -- 3 Experiments and Results -- 3.1 Data -- 3.2 Experiments -- 3.3 Results -- 4 Discussion -- References -- Context-Based Normalization of Histological Stains Using Deep Convolutional Features -- 1 Introduction -- 2 Method -- 2.1 Feature-Aware Normalization -- 2.2 Normalization by Denoising -- 3 Experiments -- 4 Discussion -- References -- Transitioning Between Convolutional and Fully Connected Layers in Neural Networks -- 1 Introduction -- 2 Related Work -- 3 Method -- 3.1 Inception Module -- 3.2 Transition Module -- 4 Experiment -- 5 Results -- 5.1 Experiment 1: Comparison with Regularizers -- 5.2 Experiment 2: Comparing Architectures -- 5.3 Experiment 3: BreakHis -- 6 Conclusion -- References -- Quantifying the Impact of Type 2 Diabetes on Brain Perfusion Using Deep Neural Networks -- 1 Introduction -- 2 Materials -- 3 Methods -- 3.1 Compute Mean Gray Matter CBF per Anatomical Region -- 3.2 Identify candidate regions for further analysis -- 3.3 Estimate Candidate Region Association Using a DNN -- 4 Results -- 4.1 Performance Comparison of the Learning Models -- 4.2 Statistical Significance of the Proposed Model -- 5 Discussion -- 6 Conclusions. References -- Multi-stage Diagnosis of Alzheimer's Disease with Incomplete Multimodal Data via Multi-task Deep Learning -- 1 Introduction -- 2 Method -- 2.1 Multi-task Learning -- 2.2 Multi-task Deep Learning for Incomplete Multimodal Data -- 3 Materials, Preprocessing and Feature Extraction -- 4 Results and Discussions -- 5 Conclusion -- References -- A Multi-scale CNN and Curriculum Learning Strategy for Mammogram Classification -- 1 Introduction -- 2 Multi-scale CNN with Curriculum Learning Strategy -- 3 Experiments -- 4 Conclusions -- References -- Analyzing Microscopic Images of Peripheral Blood Smear Using Deep Learning -- 1 Introduction -- 2 The ShonitSystem for Analysis of Peripheral Blood Smears -- 3 Deep Learning Techniques for Analyzing PBS Images -- 3.1 Cell Extraction -- 3.2 Cell Classification -- 4 Experimental Results -- 5 Conclusion -- References -- AGNet: Attention-Guided Network for Surgical Tool Presence Detection -- 1 Introduction -- 2 Attention-Guided Network -- 2.1 Global Prediction Network -- 2.2 Local Prediction Network -- 3 Experiments -- 3.1 Datasets and Preprocessing -- 3.2 Training Procedure -- 3.3 Ablation Analysis -- 3.4 Comparison with the State-of-the-Arts -- 4 Conclusion -- References -- Pathological Pulmonary Lobe Segmentation from CT Images Using Progressive Holistically Nested Neural Networks and Random Walker -- 1 Introduction -- 2 Method -- 2.1 Lobar Boundary Segmentation -- 2.2 3D Random Walker -- 3 Experiments and Results -- 4 Conclusion -- References -- End-to-End Unsupervised Deformable Image Registration with a Convolutional Neural Network -- 1 Introduction -- 2 Method -- 3 Data -- 4 Experiments and Results -- 4.1 Registration of Handwritten Digits -- 4.2 Registration of Cardiac MRI -- 5 Discussion and Conclusion -- References. Stain Colour Normalisation to Improve Mitosis Detection on Breast Histology Images -- 1 Introduction -- 2 Related Work -- 3 Dataset -- 4 Method -- 4.1 Patch Generation -- 4.2 CNN Architecture -- 4.3 Training and Testing Workflow -- 5 Results and Discussion -- 6 Conclusion -- References -- 3D FCN Feature Driven Regression Forest-Based Pancreas Localization and Segmentation -- 1 Introduction -- 2 Method -- 2.1 Overview -- 2.2 Pancreas Localization -- 2.3 Patient-

Specific Probabilistic Atlas Generation and Pancreas Segmentation -- 3  
Experiments and Discussion -- References -- A Unified Framework for  
Tumor Proliferation Score Prediction in Breast Histopathology -- 1  
Introduction -- 2 Methodology -- 2.1 Whole Slide Image Handling --  
2.2 Deep Convolutional Neural Networks Based Mitosis Detection --  
2.3 Tumor Proliferation Score Prediction -- 3 Results -- 3.1 Datasets  
-- 3.2 Experiments -- 4 Conclusion -- References -- Generalised Dice  
Overlap as a Deep Learning Loss Function for Highly Unbalanced  
Segmentations -- 1 Introduction -- 2 Methods -- 2.1 Loss Functions  
for Unbalanced Data -- 2.2 Deep Learning Framework -- 3  
Experiments and Results -- 3.1 Experiments -- 3.2 2D Results -- 3.3  
3D Results -- 4 Discussion -- References -- ssEMnet: Serial-Section  
Electron Microscopy Image Registration Using a Spatial Transformer  
Network with Learned Features -- 1 Introduction -- 2 Method -- 2.1  
Feature Generation Using a Convolutional Autoencoder -- 2.2  
Deformable Image Registration Using a Spatial Transformer Network --  
3 Results -- 4 Discussion and Conclusion -- References -- Fully  
Convolutional Regression Network for Accurate Detection of  
Measurement Points -- 1 Introduction -- 2 Related Work -- 3  
Regressing Point Locations -- 3.1 Fully Convolutional Network with  
Center of Mass Layer -- 3.2 Convolutional Long Short-Term Memory  
for Temporal Consistency -- 4 Results.  
5 Conclusion.

---

## Sommario/riassunto

This book constitutes the refereed joint proceedings of the Third International Workshop on Deep Learning in Medical Image Analysis, DLMIA 2017, and the 6th International Workshop on Multimodal Learning for Clinical Decision Support, ML-CDS 2017, held in conjunction with the 20th International Conference on Medical Imaging and Computer-Assisted Intervention, MICCAI 2017, in Québec City, QC, Canada, in September 2017. The 38 full papers presented at DLMIA 2017 and the 5 full papers presented at ML-CDS 2017 were carefully reviewed and selected. The DLMIA papers focus on the design and use of deep learning methods in medical imaging. The ML-CDS papers discuss new techniques of multimodal mining/retrieval and their use in clinical decision support.

---