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Nota di contenuto	Part I: Review -- Chapter 1. Deep Learning and Computer-Aided Diagnosis for Medical Image Processing: A Personal Perspective -- Chapter 2. Review of Deep Learning Methods in Mammography, Cardiovascular and Microscopy Image Analysis -- Part II: Detection and Localization -- Chapter 3. Efficient False-Positive Reduction in Computer-Aided Detection Using Convolutional Neural Networks and Random View Aggregation -- Chapter 4. Robust Landmark Detection in Volumetric Data with Efficient 3D Deep Learning -- Chapter 5. A Novel Cell Detection Method Using Deep Convolutional Neural Network and Maximum-Weight Independent Set -- Chapter 6. Deep Learning for Histopathological Image Analysis: Towards Computerized Diagnosis on Cancers -- Chapter 7. Interstitial Lung Diseases via Deep Convolutional Neural Networks: Segmentation Label Propagation, Unordered Pooling

and Cross-Dataset Learning -- Chapter 8. Three Aspects on Using Convolutional Neural Networks for Computer-Aided Detection in Medical Imaging -- Chapter 9. Cell Detection with Deep Learning Accelerated by Sparse Kernel -- Chapter 10. Fully Convolutional Networks in Medical Imaging: Applications to Image Enhancement and Recognition -- Chapter 11. On the Necessity of Fine-Tuned Convolutional Neural Networks for Medical Imaging -- Part III: Segmentation -- Chapter 12. Fully Automated Segmentation Using Distance Regularized Level Set and Deep-Structured Learning and Inference -- Chapter 13. Combining Deep Learning and Structured Prediction for Segmenting Masses in Mammograms -- Chapter 14. Deep Learning Based Automatic Segmentation of Pathological Kidney in CT: Local vs. Global Image Context -- Chapter 15. Robust Cell Detection and Segmentation in Histopathological Images using Sparse Reconstruction and Stacked Denoising Autoencoders -- Chapter 16. Automatic Pancreas Segmentation Using Coarse-to-Fine Superpixel Labeling -- Part IV: Big Dataset and Text-Image Deep Mining -- Chapter 17. Interleaved Text/Image Deep Mining on a Large-Scale Radiology Image Database.

Sommario/riassunto

This timely text/reference presents a detailed review of the state of the art in deep learning approaches for semantic object detection and segmentation in medical image computing, and large-scale radiology database mining. A particular focus is placed on the application of convolutional neural networks, with the theory supported by practical examples. Topics and features: Highlights how the use of deep neural networks can address new questions and protocols, as well as improve upon existing challenges in medical image computing Discusses the insightful research experience and views of Dr. Ronald M. Summers in medical imaging-based computer-aided diagnosis and its interaction with deep learning Presents a comprehensive review of the latest research and literature on deep learning for medical image analysis Describes a range of different methods that make use of deep learning for object or landmark detection tasks in 2D and 3D medical imaging Examines a varied selection of techniques for semantic segmentation using deep learning principles in medical imaging Introduces a novel approach to interleaved text and image deep mining on a large-scale radiology image database for automated image interpretation This pioneering volume will prove invaluable to researchers and graduate students wishing to employ deep neural network models and representations for medical image analysis and medical imaging applications. Dr. Le Lu is a Staff Scientist in the Radiology and Imaging Sciences Department of the National Institutes of Health Clinical Center, Bethesda, MD, USA. Dr. Yefeng Zheng is a Senior Staff Scientist at Siemens Healthcare Technology Center, Princeton, NJ, USA. Dr. Gustavo Carneiro is an Associate Professor in the School of Computer Science at The University of Adelaide, Australia. Dr. Lin Yang is an Associate Professor in the Department of Biomedical Engineering at the University of Florida, Gainesville, FL, USA.