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Titolo	Artificial Intelligence and Machine Learning for Digital Pathology : State-of-the-Art and Future Challenges // edited by Andreas Holzinger, Randy Goebel, Michael Mengel, Heimo Müller
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Collana	Lecture Notes in Artificial Intelligence ; ; 12090
Disciplina	616.07540285 616.07
Soggetti	Artificial intelligence Computers Database management Application software Computer security Optical data processing Artificial Intelligence Computing Milieux Database Management Computer Applications Systems and Data Security Image Processing and Computer Vision
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Expectations of Artificial Intelligence for Pathology -- Interpretable Deep Neural Network to Predict Estrogen Receptor Status from Haematoxylin-Eosin Images -- Supporting the Donation of Health Records to Biobanks for Medical Research -- Survey of XAI in Digital Pathology -- Sample Quality as Basic Prerequisite for Data Quality: A Quality Management System for Biobanks -- Black Box Nature of Deep Learning for Digital Pathology: Beyond Quantitative to Qualitative Algorithmic Performances -- Towards a Better Understanding of the

Workflows: Modeling Pathology Processes in View of Future AI Integration -- OBDEX – Open Block Data Exchange System -- Image Processing and Machine Learning Techniques for Diabetic Retinopathy Detection: A Review -- Higher Education Teaching Material on Machine Learning in the Domain of Digital Pathology -- Classification vs Deep Learning in Cancer Degree on Limited Histopathology Datasets -- Biobanks and Biobank-Based Artificial Intelligence (AI) Implementation Through an International Lens -- HistoMapr: An Explainable AI (xAI) Platform for Computational Pathology Solutions -- Extension of the Identity Management System Mainzliste to Reduce Runtimes for Patient Registration in Large Datasets -- Digital Image Analysis in Pathology Using DNA Stain: Contributions in Cancer Diagnostics and Development of Prognostic and Theranostic Biomarkers -- Assessment and Comparison of Colour Fidelity of Whole slide imaging scanners -- Deep Learning Methods for Mitosis Detection in Breast Cancer Histopathological Images: a Comprehensive Review -- Developments in AI and Machine Learning for Neuroimaging.

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### Sommario/riassunto

Data driven Artificial Intelligence (AI) and Machine Learning (ML) in digital pathology, radiology, and dermatology is very promising. In specific cases, for example, Deep Learning (DL), even exceeding human performance. However, in the context of medicine it is important for a human expert to verify the outcome. Consequently, there is a need for transparency and re-traceability of state-of-the-art solutions to make them usable for ethical responsible medical decision support. Moreover, big data is required for training, covering a wide spectrum of a variety of human diseases in different organ systems. These data sets must meet top-quality and regulatory criteria and must be well annotated for ML at patient-, sample-, and image-level. Here biobanks play a central and future role in providing large collections of high-quality, well-annotated samples and data. The main challenges are finding biobanks containing “fit-for-purpose” samples, providing quality related meta-data, gaining access to standardized medical data and annotations, and mass scanning of whole slides including efficient data management solutions.

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