Basic Research

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Diagnostic Classification of Cystoscopic Images Using Deep Convolutional Neural Networks

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EDITORIAL COMMENT

Recently, we are talking about some new concepts like Deepmind, Artificial Intelligence (AI), neural networks, big data, etc. The near future heralds a new era of medicine. Advances in information and communication technologies contribute to the development of new algorithms for the diagnosis and treatment of diseases. Some researches on this subject can be found in the field of urology in the literature. Data-driven tools and techniques, particularly machine learning methods that underpin artificial intelligence, offer promise for improving healthcare systems and services. Moreover, DeepMind announced its first major health project to assist in the management of acute kidney injury. Digital technology companies such as Google, Facebook, Microsoft, Amazon, Apple, IBM, and others are all preparing, in their own ways, bids on the future of health and on various aspects of the global healthcare industry. In this work, the authors suggested the usability of deep learning to predict and classify cystoscopic findings with high accuracy. In this research, the digital atlas covering 44 cystoscopic findings that frequently observed during the clinical routine was used. After image preprocessing, they developed deep convolutional neural network (CNN) models. The deep-learning model can be integrated into the artificial intelligence-aided cystoscopic imaging diagnostic tool (AI cystoscopy) that supports urologists during the cystoscopic examination. Computer-aided diagnosis tools using feature extraction and deep learning show promise as instruments to perform diagnostic classification. The results of this study show the potential of deep learning for the diagnostic classification of cystoscopic images and have proven the potential of CNN for that. Future work will focus on integration of artificial intelligence–aided cystoscopy into clinical routines. Although some subsets were falsely recognized, the neural network architecture can be improved to increase the accuracy performance for diagnosis of cancer.

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