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## Deep Learning Techniques for Medical Image Analysis

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In recent years, deep learning techniques have been widely used in medical image analysis. These techniques employ deep neural networks to automatically extract multi-level, multi-scale, abundant information (features) from image data, which is hard to achieve with conventional machine learning techniques, which use hand-crafted feature parameters, including supervised learning (with task-driven models), unsupervised or generative learning (with data-driven models), semi-supervised learning (with hybrid task-driven and data-driven models), reinforcement learning (with environment-driven models), and physics-informed learning (hybrid task-driven and physics-driven models). The vast applications of deep learning techniques in medical image analysis cover lesion detection and segmentation, disease diagnosis, treatment monitoring, efficacy evaluation, prognostic prediction, and even biomechanical analysis. In addition to medical image post-processing, deep learning techniques can also be applied to the front-end (e.g., image reconstruction) to enhance the quality of medical imaging. Given the high level of research interest and clinical application prospects, deep learning techniques have continued to develop, especially in the field of medical image analysis. This Reprint aims to report on state-of-the-art deep learning techniques applied to medical image analysis.



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