Machine Learning Applications in Radiomic Analysis for Cancer Diagnosis

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Description

Cancer research stands at the forefront of biomedical innovation, and as we delve deeper into the molecular and genetic complexities of the disease, big data has emerged as a powerful ally. The ability to gather, process, and analyze massive datasets is revolutionizing how we understand, diagnose, and treat cancer. Central to this transformation is Machine Learning (ML), a subset of artificial intelligence that empowers computers to identify patterns, make predictions, and gain insights from large, complex datasets without explicit programming for each task.

Machine learning is not merely adding efficiency to existing research processes; it is fundamentally reshaping the landscape of cancer research by enabling personalized treatments, predicting outcomes, and discovering novel drug targets. However, the integration of big data and machine learning in cancer research also brings unique challenges related to data quality, interpretability, and ethical concerns.

Machine learning in cancer research

Machine learning is uniquely suited to cancer research because of its capacity to process vast datasets, uncover patterns, and predict outcomes. Here are some key areas where machine learning is transforming the field of oncology:

Predictive analytics and early detection: Early detection is crucial in cancer care, often significantly improving prognosis. Machine learning models can analyze patient data from imaging,