

Applications of Genetic Programming in Cancer

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Abstract

Artificial intelligence (AI) and machine learning (ML) methods have gained notable recognition for their innovative problem-solving approaches, which notably do not require understanding the problem's physical underpinnings. AI applications in medicine herald a new era of digital health, assisting physicians in delivering optimal patient care. The experience and knowledge of physicians are undeniably crucial in diagnosing diseases and treating patients. In this context, AI models facilitate the rapid learning and analysis of large datasets. Consequently, with the growing volume of data collection and the refinement of AI models, AI technologies can assist physicians and health policy-makers make more precise evidence-based clinical decisions. In cancer research, AI methodologies are extensively utilized for prognostic predictions and risk assessments. Specifically, accurately categorizing cancer patients into risk groups and forecasting individual prognoses are vital for therapeutic decision-making. Like other AI techniques, genetic programming (GP) has been employed for prognostic predictions and the classification of cancer patients.

Additionally, AI-assisted classification of cancer types may provide more precise criteria for distinguishing malignant and benign lesions. Preliminary studies in breast cancer utilizing GP have yielded significant diagnostic criteria for the classification of malignant lesions in screening mammography. Early cancer diagnosis and identifying individuals at risk for specialized screening programs are undoubtedly life-saving advancements in cancer research. In light of this, further investigations utilizing GP are recommended.

Keywords: Artificial intelligence, Machine learning, Genetic programming, Cancer

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