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Office of Technology Management

AI-EMPOWERED MR-GUIDED RADIOTHERAPY FOR THE TREATMENT OF CANCER

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Value Proposition: Innovative real-time prediction method that uses deep learning to track tumors.

Technology Description

Researchers at Washington University in St. Louis have developed a pioneering method that leverages prior 3D cine MRI and simulation CT scans to predict dynamic 3D MRIs from X-ray projections using a patient-specific deep learning network. Conventional radiotherapy methods often lack precision, particularly at high doses and in complex anatomical sites, due to dynamic variations in patient anatomy during treatment. While MR-guided radiotherapy (MRgRT) offers improved accuracy through adaptive planning and real-time imaging, it is extremely complex, and its resource requirements limit its use in community hospitals.

This patient-specific deep learning network provides a scalable and accessible solution for community clinics to utilize MRgRT with conventional linear accelerators (LINACs), without having to use MR-guided radiotherapy, which enhances accessibility and adaptability, ensuring precise and personalized radiotherapy care, thereby improving the precision and effectiveness of cancer treatment for a wider range of patients.

Stage of Research

Tested in clinical setting

Applications

- Cancer treatment

Key Advantages

- Tracks tumors in real-time facilitating organ-at-risk management
- Can be integrated with conventional LINACs, enhancing accessibility and adaptability
- Makes advanced MR-guided techniques available to community hospitals

Patents

Patent application filed

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