Optimized Intensity Modulated Arc Therapy Treatment Planning System

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a system and method for improving the treatment plan associated with radiation therapy delivery.

OVERVIEW

Optimizing design plans involving systems and methods for radiation therapy has been a widely researched topic. A common goal is to deliver varying doses of radiation during treatment (higher doses to the tumor and lower doses to non-tumor tissues) while also reducing the amount of time the patient spends on the table. One current method for radiation treatment is intensity modulated radiation therapy (IMRT). This method is delivered either with a fixed gantry or a rotatable gantry.

A recently developed treatment that provides an alternative to rotational IMRT is intensity modulated arc therapy (IMAT). Existing IMAT planning systems provide relatively poor treatment plans, especially for complex cancer cases involving concave target structures surrounded by organs at risk, because they do not utilize optimization networks. An improved radiation treatment planning system for IMAT is needed.

THE INVENTION

UW–Madison researchers have developed an optimized system and method for producing an intensity modulated arc therapy treatment plan. The system utilizes two main phases to reach an optimal delivery design. Phase one includes obtaining a small set of linked radiation beam apertures and corresponding beam intensities that optimize the approximation of a collection of real-valued intensity maps that are specified along a treatment arc. Phase two requires re-optimizing the beam intensities using dose distributions corresponding to the apertures generated in phase one.

APPLICATIONS

• Radiation therapy treatment planning systems, especially IMAT systems
KEY BENEFITS

• Provides optimized, effective treatment plan for any type of cancer case
• May reduce the amount of time the patient spends on the table during treatment
• Can accompany IMRT software to generate an optimized plan from several possible plans
• Allows for flexibility in the segmentation and plan generation

STAGE OF DEVELOPMENT

Simulations have been run to generate the treatment plan.

ADDITIONAL INFORMATION

Tech Fields
Radiation Therapy - Treatment planning
Information Technology - Software

CONTACT INFORMATION

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