Method of Optimizing Radiation Therapy and Radiosurgery

Published date: Oct. 22, 2014

Technology description

A new paradigm for dose optimization that can potentially be the ideal inverse planning algorithm for Gamma Knife radiosurgery and beyond.
The method was inspired by the simulation of natural physical models. A challenging 3D C-shaped tumor surrounding a spherical critical structure was used for testing the new optimization paradigm. These tests showed that charges spread out evenly covering the tumor while keeping distance from the critical structure, resulting in a high quality plan.

Background

Gamma Knife radiosurgery has long been the treatment of choice for brain tumors and functional disorders. In Gamma Knife radiosurgery, specialized equipment focuses tiny beams of radiation on a tumor or other target. The precision of this type of radiation therapy results in minimal damage to healthy tissue surrounding the target area and oftentimes has a lower risk of side effects. Gamma Knife radiosurgery is an appropriate alternative to standard brain surgery for many patients.
Current Gamma Knife systems can produce spherical dose volumes of different sizes. Treatment planning is a ball packing process, whose goal is to pack these spherical dos volumes into a target tumor volume to create an ideal dose distribution. The ball packing problem is computational intractable, as a result there are still no satisfactory computer automated inverse planning algorithm for Gamma Knife.

Technology Description

University of New Mexico researchers have developed a new paradigm for dose optimization that can potentially be the ideal inverse planning algorithm for Gamma Knife radiosurgery and beyond. The method was inspired by the simulation of natural physical models. A challenging 3D C-shaped tumor surrounding a spherical critical structure was used for testing the new optimization paradigm. These tests showed that charges spread out evenly covering the tumor while keeping distance from the critical structure, resulting in a high quality plan.

About STC.UNM

As the technology-transfer and economic-development organization for the University of New Mexico, STC.UNM protects and commercializes technologies developed at the University of New Mexico (UNM) by filing patents and copyrights and transferring the technologies to the marketplace. We connect the business communication (companies, entrepreneurs and investors) to these UNM technologies for licensing opportunities and the creation of startup companies.

Application area

Dose optimization
Charges spread out evenly, covering the tumor while keeping distance from critical structures
Treatment time as part of the optimization
Applications in the fields of radiation oncology, radiation therapy, radiosurgery

Institution

The University of New Mexico

Inventors

Shuang Luan
Daniel Riofrio Almeida

联系我们

叶先生

电 话：021-65679356

手 机：13414935137

邮 箱：yeyingsheng@zf-ym.com