Clear View: Radiation Therapy Optimization Software

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Technology description

Market Summary

Radiation therapy treatment is administered to patients using external beam radiation generated by a linear accelerator (LINAC). The LINAC is mounted on a rotating gantry, which moves around a patient following a pre-planned and programmed treatment program, while the patient receiving the treatment lies on the couch which also moves. Collisions between the rotating LINAC gantry and the patient, table or immobilization devices are a concern, and the potential for a collision has increased with the use of non-coplanar beams and arcs. The World Health Organization (WHO) recommends at least one LINAC per one million people, presenting an additional unmet need which will continue to increase in developing countries.

Technical Summary

Radiation treatment plans are custom designed for individual patients without full knowledge of potential collision zones. The lack of knowledge can lead to two suboptimal scenarios: 1) a collision exists and is found on the first day of treatment, resulting in a modification of the treatment plan and subsequent delay of treatment for the patient, and 2) the treatment planner avoids potential collisions, but has insufficient geometric information to make decisions to select optimal radiation beam angles that would better spare normal tissues.

Emory inventors have developed software that allows patient-specific collision visualization, showing safe and unsafe gantry and couch positions. The Clear View Radiation Therapy system enables the treatment planner to place the 3-D model of the patient on a virtual model of the treatment device and simulate the motions of the LINAC gantry and couch. The software visualizes and evaluates all possible gantry and couch positions for potential collisions. Clear View Radiation Therapy uses a 3-D optically scanned model of the patient which may be acquired concurrently with the initial CT scan used for planning the radiation therapy.

Application area

Software for planning radiation therapy and ensuring adequate clearance between the patient and the radiotherapy device during treatment

Advantages

3-D optically scanned model takes into account the geometry of the entire body, allowing the planning of radiation therapy to be customized for each patient.
Visualizes all possible gantry and couch positions to ensure optimized treatment planning.

Institution

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