Systems and Methods for Real-Time Radiation Therapy Gantry Collision Detection

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SUMMARY

Researchers in the UCLA Department of Radiation Oncology have developed a novel means to remotely visualize a radiotherapy treatment room in real-time via 3D camera technology.

BACKGROUND

Radiotherapy is widely used to treat many cancers. The workflow for performing radiotherapy includes patient positioning in the intended treatment position. Frequently radiation therapists will consult with other experts (e.g. radiation oncologists, dosimetrists, or medical physicists) regarding patient position; however, in rural settings and developing countries, these experts may not be readily accessible to the radiation therapists. One potential solution would be to utilize remotely located experts to assist with these consultations. In order to do so, remote experts would need to visualize the patient position and general setup of the treatment room.

INNOVATION

This invention allows for remote, real-time visualization of a radiotherapy room via a multi-3D camera framework. While other groups have utilized 3D visualization frameworks for training, planning and treatment simulation, Dr. Santhanam and colleagues provide the first demonstration of feasibility for using 3D visualization in the treatment room. This invention is a real-time, multi-3D camera-based imaging system that provides real-time 3D images of patient position at resolutions necessary for effective visualization.

APPLICATIONS

- Radiotherapy treatment rooms
- Other treatments where remote expertise could help with patient placement in treatment rooms

ADVANTAGES

- Allows for remote, real-time analysis of treatment room and patient position for radiotherapy
- Eliminates need for radiotherapy experts to be on-site in rural clinics or developing countries
- Increases accuracy of patient treatment by providing access to radiotherapy expertise

STATE OF DEVELOPMENT

Feasibility of remote, real-time visualization of 3D images was demonstrated at UCLA (see publication).

RELATED MATERIALS

- A. P. Santhanam, Y. Min, T. H. Dou, P. Kupelian, and D. Low, A client-server framework for 3D remote visualization of radiotherapy treatment space, in Frontiers in Oncology, 2013.

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Systems and Methods for Real-Time Remote 3D Radiotherapy Treatment Monitoring
- Systems And Methods For Real-Time Tracking Of Patient Anatomy Changes
- Developing Physics-Based High-Resolution Head And Neck Biomechanical Models

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INVENTORS

- Santhanam, Anand P.

OTHER INFORMATION

KEYWORDS

remote visualization, radiotherapy, 3D monitoring, patient positioning, client-server architecture

CATEGORIZED AS

- **Imaging**
  - 3D/Immersive
  - Medical
- **Medical**
  - Disease: Cancer
  - Imaging

RELATED CASES

2012-696-0

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