Systems And Methods For Real-Time Tracking Of Patient Anatomy Changes

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SUMMARY

Researchers in the Department of Radiation Oncology at UCLA have developed a system that enables physicians and radiology technicians to track a patient's posture and anatomical changes in real-time. This invention will enable healthcare providers to track physiological changes in a patient undergoing radiation therapy and give them the freedom to modify treatment to account for such changes.

BACKGROUND

Patient position is crucial to a number of medical procedures. For example, during external beam radiation therapy, which is the most widely used type of radiation therapy for treating cancer, healthcare providers must track a patient's position in the radiation delivery system and adjust treatment to accommodate movement. Patient position is currently tracked by imaging methods such as kilo voltage or cone beam computed tomography. However, processing of these image datasets is time-consuming and does not provide an accurate assessment of the patient's current position. Further, these techniques require manual operation to register images. A method that allows for hands-free, real-time tracking of a patient's position would improve the accuracy and efficacy of radiation therapy.

INNOVATION

Researchers in the Department of Radiation Oncology at UCLA have developed a system that enables physicians to track a patient's posture and anatomical changes in real-time. This invention will enable radiation therapists, radiation oncologists, dosimetrists, or medical physicists to track physiological changes in the patient undergoing radiation therapy with the freedom of modifying the treatment to account for such changes. This system could also be applicable to other medical treatments, such as surgery.

APPLICATIONS

- Track patient position during radiation therapy or surgery in real time
- Radiation therapy planning tool
- Remote patient monitoring

ADVANTAGES

- Real-time feedback on patient position and anatomy
- Allow radiation therapists, radiation oncologists, dosimetrists, or medical physicists to adjust treatment as necessary
- Higher accuracy than available methods
- 3D-imaging

STATE OF DEVELOPMENT

This invention is in the developmental stage. A working prototype has been developed and is being extensively tested in clinical setups.

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Systems and Methods for Real-Time Radiation Therapy Gantry Collision Detection
- Systems and Methods for Real-Time Remote 3D Radiotherapy Treatment Monitoring
- Developing Physics-Based High-Resolution Head And Neck Biomechanical Models

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OTHER INFORMATION

KEYWORDS

Radiation therapy, oncology, cancer treatment, anatomical tracking, surgery, remote patient monitoring, 3D imaging

CATEGORIZED AS

- **Imaging**
  - Medical
- **Medical**
  - Devices
  - Disease: Cancer
  - Imaging

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