

3813

A Customized Cancer Radiation Treatment Planning Simulation System via Networks

Oyeon Kum¹

¹ Combinatorial and Computational Mathematics Center Pohang University of Science and Technology, Pohang, 790-784, Korea

okum@postech.ac.kr

The telemedicine using independent client-server system via networks can provide high quality normalized services to many hospitals, specifically to local/rural area hospitals. This will eventually lead to a decreased medical cost because the centralized institute can handle big computer hardware systems and complicated software systems efficiently and economically. Customized cancer radiation treatment planning for each patient is very useful for both a patient and a doctor because it makes possible for the most effective treatment with the least possible dose to patient. Radiation planners know that too small a dose to the tumor can result in recurrence of the cancer, while too large a dose to healthy tissue can cause complications or even death. The best solution is to build an accurate planning simulation system to provide better treatment strategies based on each patient's computerized tomography (CT) image. We are developing a web-based customized cancer radiation therapy simulation system consisting of four important computer codes; a CT managing code for preparing the patients target data from their CT image files, a parallel Monte Carlo high-energy beam code (PMCEPT code) for calculating doses against the target generated from the patient CT image, a parallel linear programming code for optimizing the treatment plan, and scientific data visualization code for efficient pre/post evaluation of the results. The whole softwares will run on a high performance Beowulf PC cluster of about 100 CPUs. Managing hardware and software systems is not an easy task for a hospital. Therefore, we integrated our system into the client-server system via networks and provide high quality normalized services to many hospitals.

Keywords : Telemedicine, Client-server system, Customized Radiation Therapy Planning Simulation System