A 3D computer assisted treatment planning system for breast cancer brachytherapy treatment

Yuchong Rachel Jiang
Sheridan College, Canada

This paper describes a 3D computer assisted treatment planning system that we created for breast cancer brachytherapy treatment. The system was developed using mathematical theories for accurate volume estimation and dose analysis as well as advanced 3D visualization technologies. The patient treatment volume reconstructed by a method developed in our system significantly improves the accuracy of existing methods and guarantees the high volume accuracy requirement of radioactive seed implantation procedure for this treatment. The virtual 3D environment in our system enables radiation oncologists to perform volume measurements, seed placements, and dose distribution planning and analysis based on 2D contours on patient CT images. Furthermore, the system is able to embed placed seeds on original patient CT images and displayed in 3D. Our system achieves 99.73% accuracy in volume estimation measured against the true volume and is statistically significantly more accurate than current existing commercial software at the p=0.05 level. Further development will be discussed.

Biography

Yuchong Rachel Jiang is a faculty of Applied Science and Technology, Sheridan College Institute of Technology and Advanced Learning. He specializes in the treatment of breast by using 3D computer assisted treatment.

rachel.jiang@sheridancollege.ca