

AbstractID: 8828 Title: Development and application of a robust toolkit, Tomo-XML-DOM, for helical tomotherapy system

Purpose: To develop and implement a robust toolkit for analyzing XML files for patients treated on the Hi-ART II helical tomotherapy system and to use the developed tool to facilitate post patient treatment analysis for research or administrative purposes.

Method and Materials: The input file to the program is the patient Extensible Markup Language (XML) file. We used XMLDOM and JavaScript for file access and manipulation and Hyper Text Markup Language for graphical user interface. The XMLDOM is the Document Object Model for XML and defines a standard set of objects used in accessing and manipulating XML. JavaScript embedded in the HTML codes is used to create an instance of the XML parser for file manipulation. An XML parser enables us to load the XML file into computer memory. The toolkit has been designed to work on IE, Firefox and Mozilla.

Results: The GUI options enable us to describe all the files in the archived patient folder stored in the form of unique identifiers (UID). This is a time efficient process considering the large number of files involved. We can also display data related to patient diagnosis and prescription, radiotherapy planning and delivery. With data manipulation, we can perform simple quality assurance checks such as track and match delivered to prescribed dose or apply different computational algorithms for verification purposes. The latter was illustrated by performing a second check on the calculated ROI volumes. Green's theorem was applied on each contour data to approximate the surface area and then multiply by the slice thickness to obtain the slice volume. Our results agreed to within 1% of the TPS calculated volumes.

Conclusion: A robust toolkit for analyzing patient XML files treated on tomotherapy system has been developed and tested. It facilitates research and patient post analysis following radiotherapy on this system.