

AbstractID: 2114 Title: A Distributed Data Submission, Visualization and Data-Mining System for Radiotherapy Clinics

We describe the design and implementation of a web-based multi-tiered system, which is used for the clinical data submission, archiving, retrieval, and data mining of radiotherapy treatment plans. The system uses SOAP/XML and ASP web-services for secure client-database communication and data exchange. A set of clients is designed for DICOM objects and ROTG data sets analysis, visualization and drill down. A distributed database subsystem is modeled based an extension of the DICOM Real-World information Model. The system can also function as a Radiotherapy PACS. Our SOAP/XML interface provides a mechanism for accessing all aspects of archived data for context based and image-based data mining. Users can query the system based on details of the treatment plan parameters, such as DVH, CTV and GTV. Image based data mining can be performed for CT central axial cuts. The image based data mining is based on a wavelet texture-based feature extraction classification methodology, where all archived data sets are pre-classified for fast query response. The image texture-based classification vector is created using a set of orthonormal radial wavelet basis functions, resulting in a rotation invariant image classifier.