

Automated Quality Assurance System or Clinical CT Systems

Client: Prof. Timothy Szczykutowicz

Advisor: Prof. John Webster

Team

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Date: March 30 - April 7

Problem Statement

CT machines are carefully tested on a daily, weekly, monthly, and annual basis. Each time a CT machine is tested, many different components of the machine are analyzed to ensure the machine is properly calibrated and working. The complexity of the testing procedures makes CT quality assurance testing and reporting an extremely time consuming task. The results of each test are recorded manually and entered into spreadsheet-based reporting tools.

The reports and testing procedures often vary between medical physicists making it difficult for the results to be replicated by CT repair technicians. The two main goals of this project are to create standardized testing protocols for use within the facility and to automate the reporting process. The client would like a software program capable of reading DICOM images (images produced by the CT scanner) from various quality assurance tests, evaluating the images without user interaction, generating a report from the results, and writing the results to a database to track scanner performance over time.

Summary of Team Accomplishments

- Outreach on Friday
- Finished software program
- Presented program to BME 530 students to perform testing

Upcoming Week's Goals/Individual Goals

- Analyze testing results
- Make improvements
- Set up client meeting

Project Difficulties

None

Project Goals

- ✓ Find all program bugs this week and next week
 - Fix all bugs ✓
 - Create help buttons & prompts ✓
 - Create user manual & videos ✓

- ✓ Update PDS

- ✓ Prepare paper for March symposium
 - Ask client about writing abstract ✓

- ✓ Develop testing protocol
 - ask about IRB ✓
 - For people we know first
 - Create survey questions - part of protocol ✓
 - Talk about in BME 530 - ask class to try out
 - Then distribute in WIMR/online

- ✓ Preliminary Presentation
 - Improvements and bug fixes ✓
 - Testing plans ✓
 - Publishing plans - client was maybe mentioning in his book ✓

- Evaluate testing results
 - Make improvements
 - Changes

- Final packaging & distribution
 - Executable made ✓
 - Mac version created ✓

- ✓ Outreach done
 - Possibly spirometer ✓
 - Middleton High School ✓