

Automated Quality Assurance System or Clinical CT Systems

Client: Prof. Timothy Szczykutowicz

Advisor: Prof. John Webster

Team

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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

- Met with client
 - Went over laser and couch section
 - Went through tests with program to see what we needed to change
- Manual artifacts calculation/input added
- Couch calculations added
- Laser panel added - no calculations yet
- Program code tidied up with functions and tables to replace multiple user input boxes
- Finished preliminary presentation - present tomorrow

Upcoming Week's Goals/Individual Goals

- Complete abstract
- Complete preliminary report/journal article rough draft
- Continue to added laser and couch functionality

Project Difficulties

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

Outreach

- Possibly spirometer
- Possibly middleton HS