Checkpoint Presentation:
A New Generation of Quality Assurance
For Radiation Oncology

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1. Project Overview

Design and release a **commercial** software for Raven QA which includes:

- Image Acquisition
- Image Processing
- Motor Control
- User Workflow Guidance.
2. Deliverables Review

• **Minimum Deliverables:**
  - Image Acquisition
    - Camera Correction: Done
  - Image Processing: Done
  - Motor Controlling
    - Step Motor Control: Done
    - Inclinometer Control: Not started yet

• **Expected Deliverables:**
  - 3D Rendering: Done
  - Workflow Guidance: Done
  - Report Generation: Done

• **Maximum Deliverables:**
  - Internet database: Partially Done
  - Software Documentation: Draft Done
3. Technical Approach: Image Acquisition

- 16-bit grey scale images
- Image morphing while QA Box rotates
- Image correction

- CCD Camera ➔ Flex Map ➔ Undistortion ➔ Background Subtraction ➔ Median Filter ➔ Image Erode
3. Technical Approach: Image Processing

- Light Field Collimator Center
- Image Movement
- Light Field Radiation Coincidence
- Light Field Parameter Calculation
- Radiation Field Collimator Center
- Laser Coincidence
- Image Comparison
3. Technical Approach: Image Processing

- Light Field Collimator Center

1. Image
2. Image Differentiation
3. Edge Detection
4. Greyscale Projection Integration
5. Smallest Cover Circle
3. Technical Approach: Workflow Guidance

- **Facility**
- **Machine**
- **Month**
- **Mechanicals/Optical**
  - **Collimator Rotation**
  - **Gantry Rotation**
  - **Table Rotation**
  - **Table Longitudinal Movement**
  - **Table Lateral Movement**
  - **Table Vertical Movement**
  - **Light Field**
  - **Laser Coincidence**
- **Radiation**
  - **Light Field Radiation Coincidence**
  - **Collimator Rotation**
  - **Gantry Rotation**
- **Output**
  - **Photons**
  - **Electrons**
- **Energy Check**
  - **Photons**
  - **Electrons**
- **Flatness and Symmetry**
  - **Photons**
  - **Electrons**
4. Milestones

- March 7: Software Image Processing Demo
- March 17: Software Documentation Draft
- March 28: Software Demo
5. Management Plan in the future

- April 10: Get the Inclinometer
- April 20: Validate Control Laws
- April 25: Extend Local Database to Internet Database
- April 30: Finish Software Documentation
Thanks for your attention!

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