1. Objectives

- Resolve remaining issues with coordinate mismatches in mouse interactions and selection box functionality.
- Refine the cropping function to ensure precise selection and processing.
- Optimize the image loading process by integrating company-provided libraries.
- Enhance debugging capabilities for better identification of transformation errors.

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2. Activities

- **Control Panel and Layout Adjustments:**
    - Set a fixed height for the control panel instead of dynamic height based on its contents.
    - Removed the control panel collapse functionality for consistent layout behavior.
- **Coordinate System Fixes:**
    - Updated mapToScene() to account for viewport offsets:
        - Converted screen coordinates to normalized device coordinates (-1 to 1) before applying the inverse view transform.
        - Adjusted for the control panel height and ensured all mouse handlers respected viewport boundaries.
    - Ensured rectangle drawing logic consistently used transformed coordinates and removed tiny rectangles (< 1 pixel).
    - Declared and accounted for the title bar height within mapToScene() for accurate cursor-to-point mapping.
    - Adjusted handleMousePress to verify clicks within the viewport and debug remaining distance errors.
- **Image Loading Optimization:**
    - Replaced the loadImage() function with company-provided libraries, significantly speeding up the image loading process.

- **Cropping Function Fixes:**
    - Fixed cropping issues caused by image scaling to fit the window:
        - Updated processCurrentImage() to apply rotation before cropping.
        - Added a rotation tracking mechanism in imageprocessor.h.
        - Transformed selection coordinates using mapToScene() within cropToSelection() for precise cropping.
        - Added bounds checking and ensured the cropped image fit the view automatically after processing.
    - Updated the status bar to display image size and window dimensions for enhanced debugging.
    - Identified precision and edge cases in transformation logic requiring further refinement.

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3. Achievements

- Resolved major issues with cursor alignment and viewport transformation by accounting for control panel and title bar offsets.
- Accelerated the image loading process using company-provided libraries, improving efficiency.
- Fixed cropping inaccuracies by integrating proper coordinate transformations and bounds checking.
- Improved debugging tools with additional status bar information for better monitoring of image and view dimensions.

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4. Problems & Solutions

1. **Problem:** Cursor and point misalignment in the viewport.
    - **Solution:** Updated mapToScene() to account for the control panel and title bar heights, ensuring accurate coordinate transformation.

2. **Problem:** Cropped image did not match the selection region.
    - **Solution:** Applied rotation tracking and precise coordinate transformations in cropToSelection(), ensuring cropping matched the selected region.
3. **Problem:** Tiny rectangles cluttered the scene during drawing.
    - **Solution:** Automatically removed rectangles smaller than 1 pixel in handleMousePress.
4. **Problem:** Inefficient image loading process.
    - **Solution:** Integrated company-provided libraries for loadImage(), significantly improving speed.
5. **Problem:** Precision issues in cropping and transformation logic.
    - **Solution:** Refined coordinate handling, added bounds checking, and adjusted view dimensions for better accuracy. Further refinements planned for edge cases.