Objectives

- Improve the single-axis calibration functionality and ensure parameter updates are reflected accurately in the UI.
- Resolve redundancy issues in the UI parameter request during calibration.
- Investigate and address merging issues with calibrated and interlaced images.
- Add a clamping mechanism to prevent pixel values from exceeding valid ranges during calibration.

Activities

1. **Revert Function Update:**
    - Enhanced the revert function to support single-axis calibration, allowing users to undo changes made to a specific axis.
2. **Parameter Display Update:**
    - Modified `processCalibration()` and `updateLastAction()` methods to update the parameters box in the UI, displaying the latest calibration parameters.
3. **UI Redundancy Fix:**
    - Identified an issue where `setupPreProcessing()` and `processCalibration()` both requested parameters from the UI, causing duplication.
    - Adjusted the workflow to ensure only `processCalibration()` requests the parameters, eliminating redundancy.
4. **Calibration Improvement:**
    - Reviewed algorithms and methods for calibration processing to identify areas for further improvement.
    - Introduced a clamping mechanism in the calibration process to ensure pixel values remain within valid ranges, preventing out-of-bound errors.
5. **Merge Function Update:**
    - Investigated why the merged image output was degraded compared to the calibrated and interlaced image.
    - Updated the `mergedInterlacedSection()` and helper functions, significantly improving the output quality.

Achievements

1. Enabled the revert function for single-axis calibration, enhancing user flexibility.
2. Streamlined the UI to avoid duplicate parameter requests during calibration.
3. Improved the merging process, producing better output quality from calibrated and interlaced images.
4. Implemented clamping in the calibration process to maintain pixel integrity.
5. Updated parameters display functionality, ensuring the UI reflects the latest calibration details.

Problem & Solution

1. **UI Parameter Duplication:**
    - **Problem:** Parameters were requested twice due to overlapping calls from `setupPreProcessing()` and `processCalibration()`.
    - **Solution:** Restricted parameter requests to `processCalibration()` only.
2. **Pixel Value Overflow in Calibration:**
    - **Problem:** Calibration adjustments could cause pixel values to exceed valid ranges.
    - **Solution:** Added a clamping mechanism to ensure pixel values remain within allowable limits.
3. **Degraded Merged Image Output:**
    - **Problem:** Merging calibrated and interlaced images resulted in degraded quality.
    - **Solution:** Refined the `mergedInterlacedSection()` and helper functions to address the issue, yielding better results.
4. **Parameter Display Not Updating:**
    - **Problem:** UI parameter box did not reflect updates after single-axis calibration.
    - **Solution:** Incorporated updates into `processCalibration()` and `updateLastAction()` to dynamically display changes.