Objectives

1. Identify appropriate input and output methods for the CLAHE function and associated tasks.
2. Update UI elements to ensure flexibility and alignment with functionality.
3. Enhance and debug key features, including CLAHE processing, histogram visualisation, and transformation functions.
4. Ensure clean code practices by removing unused code and maintaining compatibility across modules.
5. Transition core image processing functions to use double 2D pointers for improved memory handling and processing consistency.

Activities

1. **CLAHE Function and UI Updates:**
    - Identified and implemented input/output methods for CLAHE.
    - Updated applyThresholdCLAHE with double 2D pointer inputs.
    - Addressed UI window geometry constraints by replacing setFixedHeight() with setSizePolicy() for better flexibility.
2. **Enhancements and Bug Fixes:**
    - Cleaned unused code in CLAHE.h and source files.
    - Debugged the “Interlace & Merge” function, temporarily removing it due to persistent crashes.
    - Discussed and adjusted threshold CLAHE effects during a short meeting.
3. **New Features:**
    - Added a “Load Pointer” button for TXT file handling in 1D and 2D methods.
    - Integrated the “Load Pointer” functionality into the “Browse” button with user-guided input method selection.
    - Updated the “Save” button using ImageReader functions.
    - Added CLAHE graph in the histogram visualisation with enhanced axis configurations.
4. **Function Transformations:**

- Transformed crop, median filter, high-pass filter, edge enhancement, and other transformation functions to utilise double 2D pointers for improved processing.
- Transitioned data storage to double** pointers, replacing vector operations.
- Updated rotation, padding, stretching, and distortion functions with new methodologies.

Achievements

1. Achieved functional integration of CLAHE processing methods with enhanced UI responsiveness.
2. Successfully transitioned multiple image processing functions to double 2D pointer methods, ensuring consistency and robustness.
3. Enhanced histogram functionality with better visualisation and CLAHE graph integration.
4. Identified bugs and classified them as either critical or minor for prioritisation.

Problems & Solutions

1. **Persistent UI Constraints:**
   - **Problem:** Fixed height restrictions caused inflexible widget sizing.
   - **Solution:** Removed setFixedHeight() and adopted setSizePolicy() for dynamic resizing.
2. **Interlace & Merge Function Crashing:**
   - **Problem:** Crashes persisted post memory allocation updates.
   - **Solution:** Temporarily removed the function while investigating the root cause.
3. **Threshold CLAHE Overflow:**
   - **Problem:** Overflow issues with dark pixel thresholds in CLAHE effects.
   - **Solution:** Explored redistribution of dark pixels across the image; further debugging is ongoing.
4. **Rotation Issues:**
   - **Problem:** Pixel loss and disappearance post-rotation.

- **Solution:** Identified it as a critical issue; further debugging and adjustments required.

5. **General Debugging Challenges:**
    - Conducted clean-up processes for unused code and ensured proper memory allocation across functions to avoid errors.