**Task Progress Update Report**

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# **Overview of Tasks**

**Task 1 :** **Convert CLAHE function into double 2D pointer method**

**Objective :** Ready for integration and fit to the library that is given.

**Status :** Completed

**Details :**

* Ensured that the image that input and output for CLAHE function are neither normal nor threshold method is displayed in double 2D pointer method instead of vector method.

**Task 2 :** **Window geometry constraints at Windows and UI**

**Objective :** Ensure the error message will not show in the console while it does not affect the program.

**Status :** Delayed until main task complete

**Details :**

* Removed all setFixedHeight() calls from the labels and buttons
* Replaced them with setSizePolicy() calls using QSizePolicy::Preferred to let the widgets size themselves naturally
* Maintained the existing layout structure but allowed it to be more flexible

**Task 3 :** **Linked library and header files to the program**

**Objective :** Make the calibration and other functions the same, and make it easy for another process.

**Status :** Check on Details

**Details :**

1. Load Function

Status: Completed

* Able to load the txt file via the 1D or 2D method and merge with the previous button to load the image in multiple types.
* Show the time for loading the file.
* Created a unique dialogue box to show the load file type and some short notes for each load type.

1. Save Function

Status: Cancelled

* Changed the save function into the function inside the library.
* I tried many times but was unable to save it, and the output is saving in whole black output.
* Cancelled for this linking process, delayed until the current task is completed.

1. Interlace & Merge function

Status: Cancelled

* Able to interlace in unfold mode, but if requested into fold mode, which shows only one image, the program crashes.
* Cancelled until the current task is completed.

**Task 4 :** **Threshold CLAHE’s result**

**Objective :** Ensure that result of Threshold CLAHE is clear and also easy to check the detail

**Status :** Completed

**Details :**

* Conducted a short meeting regarding the Threshold CLAHE effect.
* Received a new concept regarding the Threshold CLAHE.
  + Categorised the threshold region into a dark mask.
  + Processed the CLAHE in the dark mask.
  + Once CLAHE is processed, the dark region from the dark mask will be distributed into the whole image instead of kept in its region.
* Completed the function, but the image, if only done in the threshold CLAHE mode the effect will not show better; but if applied normal CLAHE, then with the threshold CLAHE, some dark parts are able to see the detail very clearly.
* Conducted a short meeting again to show the result and requested to do the slide for showing the comparison.

**Task 5 :** **Convert all functions into Double 2D pointer**

**Objective :** Ensure all functions can show in Double 2D pointer without any helper function for converting from vector to double 2D pointer, vice versa.

**Status :** Completed

**Details :**

* Converted all very successfully and using the same library function for memory release for certain functions like malloc2D, etc.

**Task 6 :** **CLAHE histogram graph**

**Objective:** To check is there the CLAHE will affecting on the histogram graph.

**Status :** Completed

**Details :**

* Moved the “Show Histogram” button from the fixed zone into a unique graph group.
* Added the CLAHE graph, which will mark out the clipLimit set to the CLAHE processing; then the CLAHE graph will be green, and the original graph will be blue.
* Update that the y-axis of the graph is using the probability distribution of those pixel intensities.
* The CLAHE function will be updated for the CLAHE graph.

# **Roadblocks/Challenges**

* Memory management issues caused many functions to crash during the program runs, but they were fine for the code, like the detect and remove line function.
* The Interlaced & Merge function linked from the library is unable to be used, but we are still investigating the issues.

# **Conclusion**

* The project has achieved substantial progress, with key tasks like converting functions to double 2D pointers, enhancing the Threshold CLAHE process, and implementing CLAHE histogram graphs completed successfully.
* Despite delays in some tasks, such as the Save function and Interlace & Merge functionality, the completed tasks contribute significantly to the program's functionality and integration readiness.
* Challenges, including memory management issues and instability in certain library-linked functions, have been identified and are being addressed.