**Bugs (High priority):**

1. Seems to be a timer on the text tool. If I don’t type for 1.5 seconds it will automatically exit the text box
   1. If I backspace to delete what I typed, the timer will expire and exit the text box
   2. Is there another solution that doesn’t use a timer? – Discuss this
2. Circles are difficult to select by left clicking. Drag select works better but most users wont use drag they will simply left click to select. - 10min
3. The “go back” button Icon

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   1. shouldn’t come up with a pop-up message asking me if I want to clear the annotations if I have already saved the annotation image. It doesn’t delete the already saved annotated image at least, but it should only pop-up if there is an unsaved annotated image present when the button is clicked. 10 min
   2. Also if I just select an image, make NO annotations, and then click the “go back button”, it will still give me a pop-up. It should just go back to the live webcam with no pop-up.
4. Annotation phase: both delete button, and text input(uuid), submit/clear buttons should be disabled
5. Clicking on another image while annotation is in progress will delete all annotations without a pop-up message
   1. The same pop-up as clicking the back button should appear here. Otherwise, it is very easy to lose all the annotations with 1 click.
   2. Same with changing the patient ID while annotating. It shouldn’t be possible.
      1. At the moment, I can annotate an image, change the patient ID and save the annotated image under a different patient. This has the potential to mix up patients which is always dangerous. – same as number 4
6. When annotating you shouldn’t be able to delete an image, you should only be able to stop annotation. This is because its easy to click delete and delete the original image when you’re just trying to delete your annotations (the go back button).
   1. The delete button should be greyed out when annotating.
7. Low frame rate on launching app – try with release build of opencv
   1. Only improves when I select an image to annotate, but drops again when I go back to live cam
   2. Graphical user interface, text, application

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   3. I don’t think I had this issue in the last version you sent me

**Bugs (Low priority - essential):**

1. Allow spaces in the patient ID text input box
   1. 
2. Skin template:
   1. Seems to be a new issue with it. When I move the pick points, only the pick points move and the template stays behind. When I adjust one of the pick points the image catches up suddenly.

**Bugs (Low priority – not essential):**

1. Selecting:
   1. Selecting overlapping objects is buggy (GIF D). In the GIF I’m trying to select an arrow that is within a big rectangle and it wont select.
      1. From my Unity days, a possible solution is to do a distance check every left click from the mouse position to all the pick points of all objects in the image. If the click occurs within X distance of the pick point, then the parent object is selected. I guess this could be expensive if there are lots of pick points on the screen but I still think the whole operation would take less than 300ms. Just a thought, solve it however you like.

**Bugs with no current solution and not a priority:**

1. Arrow tool: 10 min
   1. The size of the arrowhead gets bigger the longer the line. The arrowhead should remain the same size. Preferably a small sharp arrowhead. – opencv draw arrow has a bug in it, tooltip changing doesn’t work
2. Skin Ellipse tool:
   1. Massive frame rate drops when using the ellipse tool – days/weeks – Downgraded spline drawing for fewer lines/spline(max 100 line/spline – if the spline fills the whole imageText

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* + 1. The frame rate drop is greater when 2 ellipses are drawn on the same image. In practice, it is uncommon to need more than 1 ellipse per image but still possible.
    2. Even when drawing one ellipse, it is laggy when drawing the initial ellipse and when resizing. Even when **selecting** the ellipse, there is a long delay (many seconds) before it selects.
    3. I think it is trying to recalculate the template every frame. Maybe that’s why its lagging, or there is an expensive operation running every frame. I suggest clicking the template just creates it in the centre of the screen with a default size (with the ellipse check box off) and the user can then resize and reposition it. Only do this if you can’t figure out why the frame rate drop is happening. Ideally the current implementation is better if there’s no performance penalty.
  1. Ellipse should be off by default.
  2. Ellipse in the template should be a different colour (default black) and behind the red lines of the template. (not critical)

**Future Bugs / Changes:**

1. Lots of strange resizing of thumbnails when doing anything in the app – 1 hour
   1. Even selecting a thumbnail causes all the thumbnails to resize.
2. Remove the image tool tip when hovering over thumbnails. – 5min
3. Move the “loaded patients” window to be in the position of the current debug window on release. – 5min
4. Ellipses
   1. As part of circle tool? Maybe if you hold shift it’s a perfect circle otherwise an ellipse
5. Text tool:
   1. Pressing enter creates a new line
   2. Selecting text should let you edit it
      1. Possible solution is to re-create the textbox on select, and fill it with the text of the previous text box? Bit of a hack but could work
6. Webcam
   1. Adjust exposure / white balance
      1. Both opencv and twain have options for this. See appendix 1 for sample code from ChatGPT ☺

**Critical Features:**

1. Select the webcam on initial launch, and option to change the camera in settings (critical)
   1. This is the most critical feature as my program cant be tested in the lab because all the computers have built in webcams in the monitors which is selected by default. The built in webcam can’t be disabled because no admin privileges. I haven’t been able to send this application to my potential customers for testing for this reason. Actually I sent it to my Syndey lab for testing but they couldn’t use it for this reason. My current lab in Brisbane has the same issue.
2. Application shouldn’t load all patient folders/images on launch! It should only do this operation when a new patient folder is created or when an existing patient folder is accessed. (critical)
3. Print button (critical) – see appendix 2

**Fixed Bugs:**

1. When I click clear button(next to submit) and then take a photo, it saves it under the last patient number.
   1. It shouldn’t do this. Clicking clear should exit the current patient file, and no photos can be taken until a new patient ID is submitted. – 0,5h
2. Text annotation:
   1. I predict user confusion. When I click the text button then click on the image, it is not clear that the text box has been added to the image and that I can start typing. It is only when I start typing that I can see the text box appear. I know for sure this will be an issue. – first letter should be space -> delete after first letter is typed – 20min
   2. Please change font to Calibri or similar - done
   3. The font is not centred in the white background. – 20min
   4. The font size doesn’t go small enough. The lowest font size is size 2. The text should be able to go down to a quarter of the size 2 font. – 20min
   5. The default thickness should be 2, and the default size should be twice as small as the current smallest size. - 10min – thickness can only go until 2, because OpenCV crashes on 1
   6. The text box disappears (GIF B) if I try to click on anything outside the image window while I’m typing. I must “deselect” the text box by clicking inside the image window to confirm the text box, then I can select another tool. The way it should work is that once I am finished typing in the text bow, no deselecting or confirming is needed. I shouldn’t need to press enter either. – Selection of other object should be possible when typing – 20min
3. Letter iteration tool:
   1. Same font as text tool – 5min
   2. Default size should be ¼ of current size. – 20min
   3. Hotkey for this tool, using the up and down arrow keys should iterate up or down. This is because the user might want to skip a letter or duplicate the last letter.
   4. Also a big frame drop when using tool (GIF A) – days – Batch rendering solve this
   5. property for current letter(for the future) – days
4. Line tool: - 20min
   1. Should not deselect the line tool after drawing once as with other tool. The line tool should be the only tool that remains selected so you can draw multiple lines one after the other.
5. Implement the multi-line tool – 30min
6. Selecting: few hours/1 day to figure out it correctly
   1. When one shape is selected, you can’t select another shape without deselecting the first shape. It should select the next shape and deselect the previous shape automatically with one click.
   2. I have to click really far away from the selected object to deselect it. Fixable? At least reduce the size of the bounding area. (GIF C)
7. Dragging
   1. I can drag a shape even when I click and drag far away from it (see GIF C). This only seems to be an issue with lines and arrows. – 20min
8. The watermark text at the bottom of the image (with the image number, date etc):
   1. should be a solid black colour. - idk
   2. font should be Calibri or something more professional. 5min
   3. Font size should be about half of what it is now. – 5min
   4. The white area behind the text should be narrower so that more of the image shows. – 5min

**Appendix 1**

Text

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**Appendix 2**

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