User Stories, Tasks, and Acceptance Tests

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User Stories

1. As a user, I want to upload my natural scenes picture and make it more realistic.
2. As a user, I want to be able to enhance medical images to get all the important details.
3. As a user, I want to be able to enhance radar backscatter data to improve the recognizability of the structures in the image.
4. As a user, I want to be able to enhance a Hubble telescope image to increase clarity of the image.
5. As a user, I want an interface that is easy to use, visually pleasing, and allows me to choose the brightness values.

Tasks

1. User Story 1 - Natural Scenes
    a. Determine the acceptable range of brightness values.
    b. Determine lightness value range for the user.
    c. Use High Resolution Image capturing device to procure an image.

2. User Story 2 - Medical Images
    a. Determine the acceptable range of brightness values.
    b. Determine lightness value range for the user.
3. User Story 3 - Radar Backsetting
    a. Determine the acceptable range of brightness values.
    b. Determine lightness value range for the user.
4. User Story 4 - Telescope Images
    a. Determine the acceptable range of brightness values.
    b. Determine lightness value range for the user.
5. User Story 5 - Graphical User Interface
    a. Wrap the back-end image processing into a single function call.
    b. Implement browsing feature for selecting an image.
    c. Develop menus to choose which type of image.
    d. Implement text field for inputting brightness values.
    e. Generate multiple output images after settings are finalized.
    f. Allow user to select a single image object from an array of output image objects.

Acceptance Tests

1. User Story 1 - Natural Scenes
    a. Tonemap 5 images with 5 different ranges and agree upon which value range is optimal for the most cases.
    b. Tonemap 5 images with 5 different ranges and agree upon which value range is optimal for the most cases.
    c. No test required.
2. User Story 2 - Medical Images
    a. Tonemap existing image with 5 different ranges and agree upon which value range is optimal for the most cases.
    b. Tonemap existing image with 5 different ranges and agree upon which value range is optimal for the most cases.
3. User Story 3 - Radar Backsetting
    a. Tonemap existing image with 5 different ranges and agree upon which value range is optimal for the most cases.

b. Tonemap existing image with 5 different ranges and agree upon which value range is optimal for the most cases.

4. User Story 4 - Telescope Images
    a. Tonemap existing image with 5 different ranges and agree upon which value range is optimal for the most cases.
    b. Tonemap existing image with 5 different ranges and agree upon which value range is optimal for the most cases.
5. User Story 5 - Graphical User Interface
    a. Test the back-end image processing image processing function.
    b. Verify that the browse function correctly chooses a file.
    c. Make sure each radio button opens its corresponding interface.
    d. Test text field with several numeric inputs.
    e. Verify that multiple outputs are produced.
    f. Ensure that callback interacts with image objects as expected.

Group Project Report #2

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In our program we created a graphical user interface that pops up when you initially run the program. In this interface you get to select the type of image that you would like to tonemap. We chose to build a prototype of the natural scenes imagery and that is the only option that is currently functional. After you select a type you can hit the browse button and browse for the image that you wish to tonemap.

By clicking Ok you are brought to the next page of the wizard which displays the min and max pixel of the image as well as suggesting the lightness values that are best for the selected type of image. Then the user is able to select their desired lightness values by using the sliding bars. Then by hitting the ok button it conducts the tonemapping process into 5 separate images that are sent on to the next page.

In the final page all 5 tonemapped images are displayed so that the user can select the most visually pleasing image from amongst them. By clicking the 'Save' button below the image they are able to define the name for the image and save it to whichever directory selected. The saved image will then be displayed for them.

Some additional features we want to add to the final product are: when finished saving a restart option will be given to restart the program, add functionality to edit the text on the slider bars to set the lightness values, as well as implement the other 3 types of image tonemapping.

Group Project Report #3

Medical Imaging

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In the last phase of the HDR imaging project we had implemented a graphical user interface for the HDR imaging software and provided support for tonemapping photos of natural scenery via this interface. In this next step the main focus was to determine reasonable values for tonemapping black and white medical images and hooking these values into the existing GUI design. The previous work on the graphical user interface allowed each proceeding step to take considerably less time as each image type merely had to be evaluated and hooked into the interface itself.

Given that each developer on the task was at least somewhat aware of the various techniques for tonemapping, the team was quickly able to narrow down the scope of experimentation to determine what values to use when tonemapping the image. After that some trial and error was used to narrow it down to the settings that were ultimately settled upon for this task.

As stated previously, once these values were found they merely needed to be plugged into the existing interface to perform the desired functionality. The only modification required to tonemap these images were to update how the FITS images were opened and read. All data manipulation beyond this initial step proceeded as normally and expected.

Group Project Report #4

Radar Backscatter Imaging

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In the last phase of the HDR imaging project we had implemented a graphical user interface for the HDR imaging software and provided support for tonemapping photos of natural scenery via this interface. In this next step the main focus was to determine reasonable values for tonemapping black and white radar backscatter images and hooking these values into the existing GUI design. The previous work on the graphical user interface allowed each proceeding step to take considerably less time as each image type merely had to be evaluated and hooked into the interface itself.

Given that each developer on the task was at least somewhat aware of the various techniques for tonemapping, the team was quickly able to narrow down the scope of experimentation to determine what values to use when tonemapping the image. After that some trial and error was used to narrow it down to the settings that were ultimately settled upon for this task. In order to do so we created multiple scenarios in which the values of the tonemapping were adjusted and we decided on the most visually pleasing image out of the group and we continued this process until we narrowed the values down to the best images.

As stated previously, once these values were found they merely needed to be plugged into the existing interface to perform the desired functionality. The only modification required to tonemap these images were to update how the MAT images were opened and read. All data manipulation beyond this initial step proceeded as normally and expected.

Group Project Report #5

Telescope Imaging

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Developing the telescoping manipulation part of this software was very similar to the radar back scatter portion of the software. We carefully researched what kind of intricacies were important for this type of image to help us decide what our final product should look like. We used previous knowledge and started with the same tonemapping values we had for the radar imaging part of this software. Since we noticed that those values may not be optimal, we experimented with other values until we found ranges from 0.5 to 2.5 in saturation to be optimal.

Once the pictures were created, we merely needed to display them for the user. This functionality was already created previously in the project so we just reused the code. The user can also save any of the five images created at the end of the tonemapping process, and pull up the image in full size. The final images looked how we wanted them to and seemed to emulate the information we gathered about how HDR telescoping images were supposed to look.

Iterative System Integration

After the initial imaging component, natural imagery, was implemented along side the basic GUI framework, each subsequent component was developed individually and integrated into the existing project. Each component underwent complicated and intense unit testing as a stand-alone component as well as within the GUI framework.

Concluding Remarks and Future Extensions

Each component meets the client's needs as implemented and outlined in the SRS documentation. In the future, as requested by the client, new image types can be added to the existing project. An additional main loop may be added in the future to allow the user to make multiple tonemapped images (rather than only allowing a single tonemapped image, as is currently the case).

Timeline

Date	Activity	People Involved
9/28/14	**Created Acceptance Tests, User Stories and Acceptance Tests. Also created Report #1**	**All**
10/1/14	**Gathered a natural scenes image for use within our project.**	**Jim**
10/5/14	**Coded the majority of the project. Functionality for natural scenes images was created. All graphical user interfaces were created.**	**All**
10/19/14	**Added functionality to the code for the other 3 options of images.**	**All**
10/26/14	**Final touches on the code to make it run smoother. Created Reports 3,4,5 as well as the Concluding remarks.**	**All**