# Due Date: 13A Section #\_\_\_\_\_ Team # \_\_\_\_\_\_

# Project Milestone 6 – GUI Layouts and Flowcharts

***TEAM MILESTONE***

The next step in the development of your team’s nanoHUB simulation suite is to create the GUI layouts with associated flowcharts. Your team will convert your Rapid Prototype from Milestone 5 to the actual graphical-user interfaces with which your direct user will interact. For this milestone, your team will create all Tagnames for all components (see C), establish variable names for passing in all GUIs (See C), create layouts in MATLAB for all GUIs (see D-E), create flowcharts for all GUIs (see G), and code only the navigation buttons for all GUIs (see H). This is a frustration-minimizing step in the design process! Before starting on any programming, your team should be satisfied that the layouts of all GUIs are complete and their associated flowcharts are detailed sufficiently to ease coding.

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| --- |
| **Looking ahead to Milestones 7 & 8.** Your team might consider pushing forward to coding some of the basic GUIs during the M6 timeframe. This will reduce the workload during the M7 and M8 weeks. For these Milestones, the GUIs will need to be coded for full functionality (M7) and ready for a nanoHUB demonstration (M8). Start coding only after M6 requirements are met and saved in a separate folder for version control. |

Log your Team Meeting Info on a new **Team Meeting Worksheet**

Save this M6 document as **M6\_GUI\_Layouts\_sec##\_team##.docx**

A. **M6 Prep**

Create a **NANOHUB\_PROJECT** folder. All current .m and .fig files associated with the MATLAB portion of this project and other documents required for the current milestone must be maintained in this folder.

Within your **NANOHUB\_PROJECT** folder create a subfolder called **DOCUMENTS**. This is where you should place all milestones, meeting worksheets, your final report, and any other documents related to the project.

Also within your **NANOHUB\_PROJECT** folder, create a **VERSION\_01** folder. This is where you will place the .fig and .m files that you will create as part of this milestone. Each time you or a teammate are going to make significant changes to any part of your .m or .fig file, create a new **VERSION\_##** folder, copy the .m and .fig files from the previous version, and then make your changes. **Important**: Never make changes to a file before you have copied them into a new version folder! This way you don’t accidentally overwrite the previous version and, if you end up breaking something, can revert back to the old (working) version.

Note: We are using folders for version control, rather than changing filenames, because you need to use the filenames in your code to pass between GUIs! If you have to go into the code and change all the filenames for every iteration, it will get very tedious and prone to errors!

B. **M5 Review**

Review feedback received on M5. In the answer sheet, answer these two questions:

* ***In your own words***, what feedback have you received on M5?
* How are you addressing this feedback in M6?

1. Create a Filename, Tag, and Variable Inventory by completing the table in the Design Worksheet.

The following Tag naming conventions should be used to name GUI component Tags in all GUI files. *UniqueName* is what you decide to call a particular Tag.

|  |  |
| --- | --- |
| **Component Type** | **Standard Tag Name** |
| Push Button | UniqueName\_pb |
| Slider | UniqueName\_sl |
| Radio Button | UniqueName\_rb |
| Checkbox | UniqueName\_cb |
| Edit Text | UniqueName\_et |
| Static Text | UniqueName\_st |
| Pop-up Menu | UniqueName\_pm |
| Listbox | UniqueName\_lb |
| Toggle Button | UniqueName\_tb |
| Table | UniqueName\_ta |
| Axes | UniqueName\_ax |
| Panel | UniqueName\_pa |
| Button Group | UniqueName\_bg |

Use your Rapid Prototypes as a guide to create an inventory of GUI filenames, Tags, and variables. Tags must be listed for all user-interactive and code-manipulated components on all GUIs. Static text components that will *never* change do not need to have their Tags changed from the default MATLAB assigns. In the table in the answer sheet, your team must list for each GUI component:

* The GUI filename (see C-E below for specifics on acceptable GUI filenames)
* A brief description of the GUI component
* The GUI component Tag
* A list of variable (as needed) that will need to be passed between GUIs and/or added to **handles** for passing among subfunctions within a GUI or between GUIs.

1. Use MATLAB’s GUIDE to create your opening program window. Save this GUI as **nanohubGUI\_sec##\_team##**. Remember that two files will be generated - the .m file and the .fig file.

Your Opening GUI layoutmust include, at a minimum:

* Your project title, your section number, team number, and your team member names
* A button to launch the starting GUI for your solution
* A button to allow access to a list of citations used for your solution

1. Use MATLAB’s GUIDE to create the GUI that lists your team’s citations. Save this GUI as **citationGUI\_sec##\_team##**. Again, remember that two files will be generated – an .m file and a .fig file. List, using APA format, the citations used for your solution. **Left justify your text.** Citations must be provided for images, content, and ideas that your team used to develop your solution.

If your team breaks your citations up into multiple GUIs, name them as **citationGUIx\_sec##\_team##** where **x** has some logical meaning such as a number, simulation name, or author login.

1. Use MATLAB’s GUIDE to create all remaining GUI layouts to satisfy NCN’s criteria (refer to the memo for M1). Again, remember that two files will be generated for each GUI created. Filename suffixes should be either **\_authorlogin** or \_**sec##\_team##** to indicate coding authorship.

On each GUI layout, the responsible team member’s name must appear. In-text citations must also appear on the layout for any cited content.

1. Open your **M5\_NavMap\_sec##\_team##.ppt** file and resave as **M6\_Flowcharts\_sec##\_team##.ppt** and place it in your **NANOHUB\_PROJECT** folder. Update your Navigation Map as needed. Add your flowcharts to this file.

For ***each*** GUI (including the opening GUI, the Citations GUI(s), simulation GUIs, and other GUIs), create a flowchart, using standard flowchart symbols, that indicates what needs to happen when each GUI component on a given GUI is used. **Flowcharts must be legible**.

Each flowchart must:

1. clearly indicate the GUI filename(s) to which the flowchart belongs,
2. indicate who is responsible for coding the GUI,
3. provide the details necessary to successfully code the GUI. That is, these flowcharts should clearly convey to all members of your team, the ENGR 13200 instructional team, and any other MATLAB coder, what needs to be coded behind every the GUI. **There should NOT be gaps in logic at the end of this milestone**.

If your team has a **group of GUIs that operate exactly the same**, you may provide just one sample flowchart for the group. But clearly indicate all GUI filenames to which the sample flowchart applies. This might apply to a series of citation, instructions, help, or hints GUIs.

1. Using your Navigation Map, Rapid Prototypes, and your Filename, Tag, and Variable Inventory as a guide, add code to each GUI so that all navigation and exit/close options work. Do not code for any other functionality for your M6 submission.

**Reminder: All GUIs must have a means of exiting gracefully without shutting down MATLAB**. The only option for the user should not be the X in the upper-right corner of each GUI window. (***Hint:*** Refer to the GUI Code Example - MultiGUI posted on Blackboard Course Resources > GUI Resources for an example of a Quit button.)

1. **Zip your most recent VERSION\_## folder (the extension must be .zip, *not* .7z or .rar or any other extension)** **then rename the zipped folder M6\_GUILayouts\_sec##team##.zip**; this folder must contain all .m and .fig files as well as **M7\_GUILayouts\_*sec###team##*.docx**. Upload the zipped folder to Bb.The contents of this zipped folder should be relevant to this milestone only and include only current .m and .fig files. DO NOT include .m or .fig files from previous versions.

Email your zipped folder to all team members. ***At no time during this project should only one member of your team be in possession of project documentation. NOTE: You should do this EVERY TIME you create a new version of any GUI file.***

J. **Teammate Contributions to M6**

1. Assign a recorder to compile the list of individual contributions to the team components of M6 in the **Design Worksheet**.

2. *Individually*, write your *own* short specific task-oriented description of what you contributed to M6. As a reminder, it would be an example of **Academic Dishonesty** if you write the contributions for another Teammate, so please only write your own contributions. Use the sentence stems provided in the answer sheet to help structure your description. Send your description to the recorder.

Keep in mind these guidelines:

* Each team member **must** write his/her ***own*** contribution description and provide it to the recorder for your team to compile into the team’s milestone document.
* If you did not contribute to this milestone, then write “I did not contribute to this week’s milestone” and send to the recorder.
* If one of your teammates did not send a contribution description and/or did not contribute to the milestone, then the recorder should leave it **blank**.
* If you feel that one of your teammate's descriptions is not accurate or a teammate did not contribute this week, please send an email to your instructor so we can help resolve.

Share this **Design Worksheet** with all of your teammates. At no time during this project should only one member of your team be in possession of project documentation.

K. **Final Report – M5 Summary**

1. Open your **FinalReport\_sec##\_team##.docx**

2. In 2 paragraphs, 300-450 total words, for ½ page total, summarize your work from M5. DO NOT include copies of tables or figures. DO summarize key outcomes from the milestone, any feedback you collected on M4, and how you responded to that feedback. Write about the big picture, with only the key specific information.

Make sure you follow these instructions on what to include in the Milestone Summaries.

This task of writing a Milestone Summary will occur with each Milestone. The compilation of these paragraphs will become your Final Report which is due in week 16.

**Deliverable by Class 13A:**

* In the same submission, upload 1 copy of this week’s Team Meeting Worksheet, **M6\_GUI\_Layouts\_sec##\_team##.docx**, **M6\_Flowcharts\_sec##\_team##.ppt**, updated **FinalReport\_sec##\_team##.docx** , and your zipped **NANOHUB\_PROJECT folder** to Assignment M6 on Blackboard

**DESIGN WORKSHEET**

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| **Our team’s Direct User is: The fabrication team for a photovoltaic quantum dot solar cell manufacturing company.** |

Complete a new **Team Meeting Worksheet**

B. **M5 Review**

***In your own words***, what feedback have you received on M5?

We haven’t received any feedback on our M5.

How are you addressing this feedback in M6?

We can’t.

C. GUI Filename with Associated Tags and Variables

\*Every single component that your team puts on a GUI that will change or the user interacts with needs to be listed individually here – THIS TABLE WILL BE LARGE!

|  |  |  |  |
| --- | --- | --- | --- |
| **GUI Filename** | **GUI Component and description** | **Tag** | **Variable Names:**   * **that must be passed between GUIs** * **that must be assigned to *handles*** |
| nanohubGUI\_sec38\_team13 | Push button to Yash’s GUI | YashGUI\_pb | NA |
| nanohubGUI\_sec38\_team13 | Push button to Rashid’s GUI | RashidGUI\_pb | NA |
| nanohubGUI\_sec38\_team13 | push button to Brody’s GUI | BrodyGUI\_pb | NA |
| nanohubGUI\_sec38\_team13 | push button to Apoorva’s GUI | ApoorvaGUI\_pb | NA |
| nanohubGUI\_sec38\_team13 | Data entry push button | dataEntry\_pb | NA |
| nanohubGUI\_sec38\_team13 | Citations GUI push button | citations\_pb | NA |
| Var\_Plot\_schwarb | Information Plot | plot\_ax | handles.(undetermined) |
| Var\_Plot\_schwarb | home button | home\_pb | NA |
| Var\_Plot\_schwarb | exit button | exit\_pb | NA |
| Var\_Plot\_schwarb | select attribute pulldown | atrSelect\_pm | NA |
| Var\_Plot\_schwarb | enterValue | atr1\_et | handles.(undetermined) |
| Var\_Plot\_schwarb | enterValue2 | atr2\_et | handles.(undetermined) |
| Var\_Plot\_schwarb | enterValue3 | atr3\_et | handles.(undetermined) |
| Var\_Plot\_schwarb | enterValue4 | atr4\_et | handles.(undetermined) |
| Var\_Plot\_schwarb | select panel | atrSelect\_bg | handles.(undetermined) |
| Var\_Plot\_schwarb | select atr 1 | atr1\_cb | NA |
| Var\_Plot\_schwarb | select atr 2 | atr2\_cb | NA |
| Var\_Plot\_schwarb | select atr 3 | atr3\_cb | NA |
| Var\_Plot\_schwarb | select atr 4 | atr4\_cb | NA |
| Var\_Plot\_schwarb | clear graph push button | clear\_pb | NA |
| Var\_Plot\_schwarb | enter data | enterdata\_pb | NA |
| Var\_Plot\_schwarb | generate plot | generate\_pb | NA |
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J. **Teammate Contributions to M6**

***Individually***, write your *own* short specific task-oriented description of what you contributed to M6. As a reminder, it would be an example of **Academic Dishonesty** if you write the contributions for another Teammate, so please only write your own contributions. Please use the following stem sentences to help structure your description:

1. (**Broderick Schwartz**) contribution was:

* I completed these tasks: Creation and editing of the Main GUI hub as well as the Var\_Plot\_schwarb.
* I was assigned, but did not complete these tasks: none.

2. (**replace** with Teammate 2’s name) contribution was:

* I completed these tasks:
* I was assigned, but did not complete these tasks:

3. (**replace** with Teammate 3’s name) contribution was:

* I completed these tasks:
* I was assigned, but did not complete these tasks:

4. (**replace** with Teammate 4’s name) contribution was:

* I completed these tasks:
* I was assigned, but did not complete these tasks:

K. Write **M5 Summary** of your **Final Report**