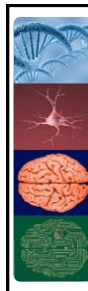

Introduction to Programming 2017/2018

Tirgul 9: GUI

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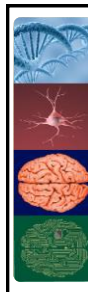
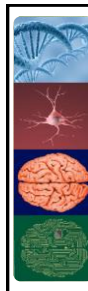


Lesson Outline

- GUI
  - Design
  - Graphical layout
  - Programming



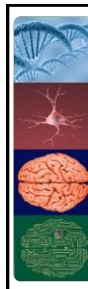
GUI - Example

- A GUI that displays sine and cosine functions according to a chosen frequency.
- Use cases
  - Display sine
  - Display cosine
  - Display both (at the same frequency)
- Use default x axis.

Design

GUI Layout

- Give meaningful names (*tag*) to controls, instead of using the default.
- Copy & Paste.
- Align controls.
- Make it look nice.
- Use ‘Enter’ !!!

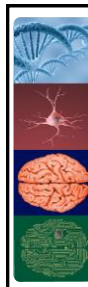


Programming the GUI

- Defining the logic that is behind the controls.
- MATLAB links between the controls and the functions in the m-file automatically.
  The programmer then needs to implement the functions (make the functions “do something”).
- For example: usually, push-buttons represent actions that should be done, and we should program these operations.

Programming the GUI

- Main types of GUI functions:
  - Opening function (*OpeningFcn*)
  - **Callback functions (*tag_Callback*)**
  - Create functions (*tag_CreateFcn*)
- Note 'DO NOT EDIT' parts.



Common data

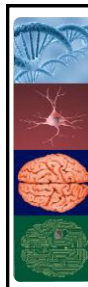
- Sometimes we need some data that will be common for all the functions in the GUI.
- Examples:
  - Array of data.
  - A value (e.g. file name) that multiple controls should know.
  - Ongoing counter.
  - Etc.

Common data

- There are several ways to do it:
  - Handles structure
    - Add a field to *handles*.
    - Use ***guidata*** to update *handles.*
  - UserData property
- Usually we will add a field to the handles structure which will be a structure in itself- to which we will add fields as we want.
- Example: count the number of operations.

Exercise

- Simple and clear (“user-friendly”) GUI.
  - Easily readable display.
  - Easy and clear controls.
- Working on GUI is endless, use common sense to know when it is good enough.
- Give meaningful names (tags) for controls.
- Test you program!



Practice

- Design a ‘**randomNumber**’ MATLAB GUI that displays a random number between 0 and another number that the user chooses.
- Build the ‘**randomNumber**’ GUI layout.
- Implement the ‘**randomNumber**’ GUI program.

Functions/Commands List

- guide
- guidata