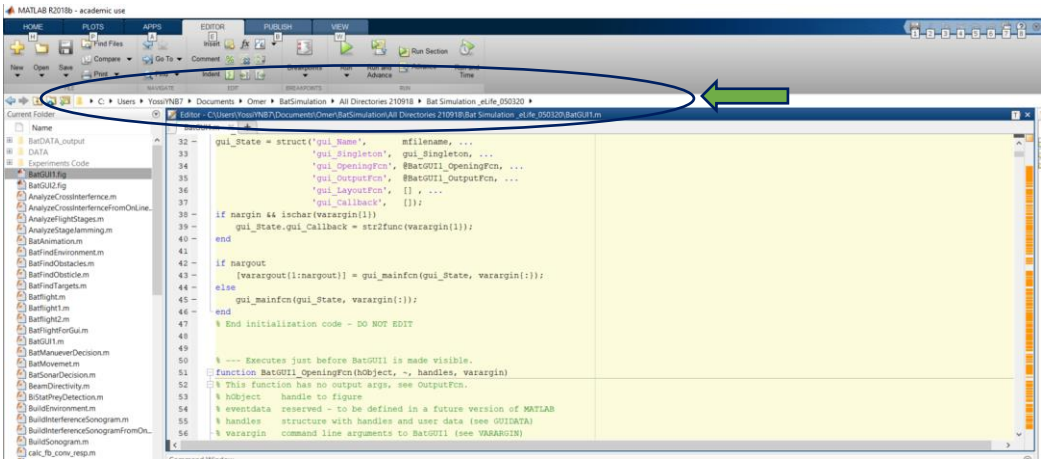
BatModel– Readme

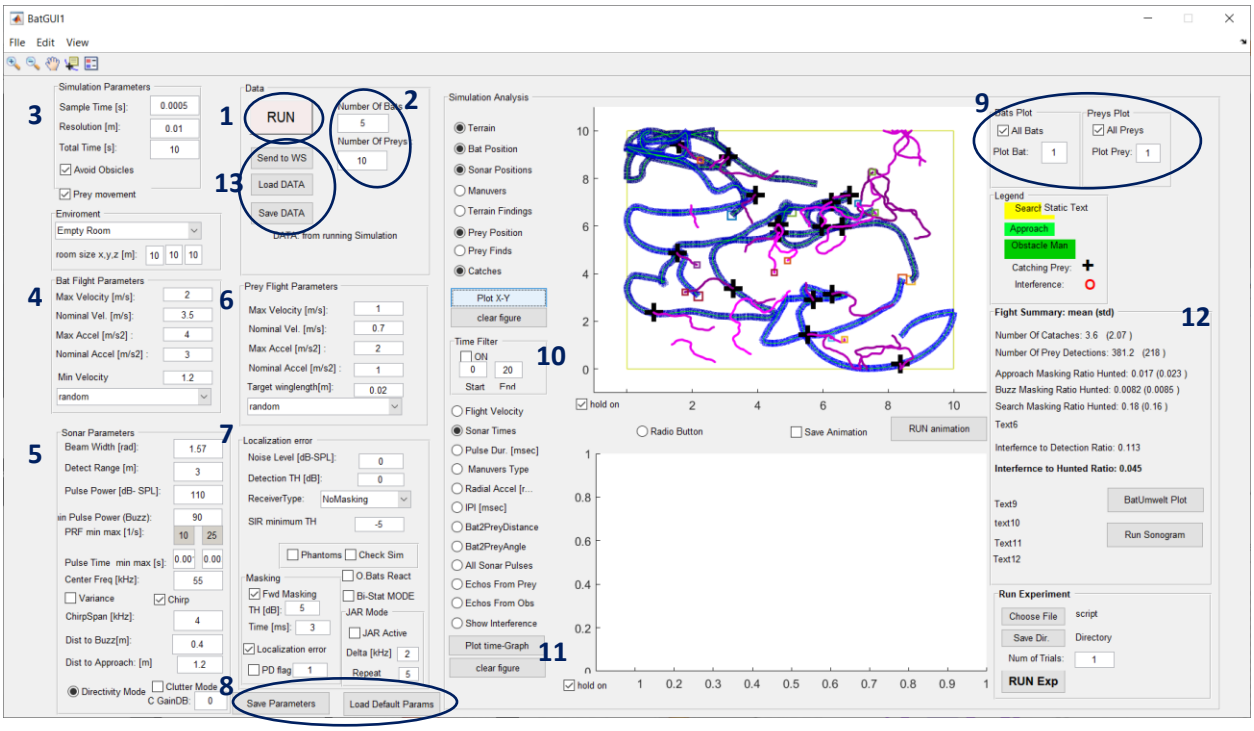
1. Extract the winrar folder to your computer.

2. Open MATLAB®: MATLAB

3. Set the path on MATLAB command window to '**BatModel**' (the folder thee code files were extracted to):



4. Type **BatGUI1** on the Command window.
   This will open the Graphical User Interface that controls and executes the simulation:



5. Run the Simulation:
   5.1. **(2)** Set how many bats and prey items participate the simulation.
   5.2. **(3-7)** Change the parameters of the simulation.

5.3. **(8)** Load or save the parameters of the simulation.

Important: Saving the parameters will change the default parameters.

5.4. **(1)** Press '**Run**' to execute the simulation.

6. Analyze the data:
   6.1. **(9)** After executing the simulation, decide which bats and prey items to plot.
   6.2. **(10)** Decide which parameter to plot in the x-y figure, and press 'Plot X-Y'.
   6.3. **(11)** Decide which parameters to plot in the time graph, and press 'Plot time graph'. Use the hold on check button.
   6.4. **(12)** Main statistics of the trial: mean values and standard deviations (in brackets).

7. Further Analysis:
   7.1. **(13**) The output data of the simulation is stored at structure called '**BatDATA**'. Press 'send to WS' to send the output to the MATLAB work-space.It is possible to load and save the output data as files.
   7.2. BatDATA consists the following fields:

BatDATA = struct with fields: **PREY**: [1×(number_of_prey_items) struct] **BAT**: [1×(number_of_bats) struct] **AllParams**: [1×1 struct] **FlightInterferceSummary**: [1×1 struct] **FilterBank**: [1×1 struct]

   7.3. Main data to analyze:
      7.3.1. **BatDATA.AllParams** – the parameters used in the simulation run (i.e. a flight)
      7.3.2. **BatDATA.FlightInterferceSummary** – main statistics regrading masking and jamming.
      7.3.3. **BatDATA. BAT(x). InterReportStrctOnLine** – detailed data for each bat.

   7.4. Main Functions and files:
      7.4.1. **BatGUI1.m –** runs the Graphical User Interfaces
      7.4.2. **BatFlightForGui.m –** The main function that executes the simulation and calls other function to caclulate all the required data.
      7.4.3. **…\DATA\ DefaultParameters.mat** – a MATLAB file with the required parameters
      7.4.4. **… BatDATA_output\ BatData_04-Mar-2020_224159.mat** – an example of an output struct after running the simulation
      7.4.5. **…\Experiments Code*.m** - some examples of code for running the model numerous times with different parameters.

Good Luck,

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