1 Requirements

- Analysis has been done using Matlab R2015a (64 Bit) on a Windows 10 PC with 16 GB RAM (please note that analysis is quite memory intensive).
- The total disk space needed for raw data (trajectories, 1.02 GB), scripts (21 MB), data generated by simulations (15 GB) and results of the analysis (450 GB) is about 466 GB.

2 Executing Analysis

1. Copy/extract all files (`Ontogeny_Data.zip`, `Ontogeny_idSocial.zip`, `Ontogeny_AdditionalData.zip`) to the same folder `..\<Your_Folder>` on your hard disk.
2. Open the Matlab script `..\<Your_Folder>\Ontogeny_plot_AllFigures.m` in the Matlab editor.
3. Execute the script either by pressing the "Run"-button on top of the the Matlab editor and choosing "Change Folder" or "Add to Path" when Matlab asks. In addition, you will be asked to enter the folder location of the script `Ontogeny_plot_AllFigures.m`, a folder for the output data (this folder can occupy UP TO 450 GB if all analyses are run), and to choose the particular analyses you want to perform.

   OR

   In line 29 of the script, change the variable "scriptsandfigures_dir" to `..\<Your_Folder>`.
   In line 34 change the variable "data_outputdir" to the path where you want the output of the analysis to be saved (this will occupy around 457 GB if you run the whole script!).
   In line 38, un-comment and adjust the variable "execute_figure" in order to choose the particular analyses you want to perform. Save the script.
   In order to let Matlab know where to find the `Ontogeny_ ...` files, add `..\<Your_Folder>` and all subfolders to the Matlab path. To do so, go to the menu on top of the Matlab command window, choose "Home", "Set Path", "Add with Subfolders". There, look for `..\<Your_Folder>`, click on "Select Folder", and then save your changes by clicking on "Save" and "Close".
   Finally, execute the entire script `Ontogeny_plot_AllFigures.m` (or the sections you are interested in).

Please note:

1. Some sections require the execution of previous sections (for example, Section "Figure S5: Comparison of different interaction rules" requires the execution of the Section "Figure 4: Model"). These dependencies are taken care of automatically.

2. Please note that execution of the whole script may take some time (around 3 days on a Windows 10 (64 Bit) PC with 16 GB RAM and Intel(R) Core(TM) i7-4790 CPU @ 3.60 GHz) and takes up many resources.

3. Figures will be saved in the folders `..\<Your_Folder>\Figure1` to `..\<Your_Folder>\FigureS11`.

3 Structure of Dataset

For each experimental trial, the dataset contains the following files:

- `trajectories.mat`: Contains the "Number of frames"-by-"Number of individuals"-by-2 Matlab array called "trajectories".
- `datosegm.mat`: Contains additional information like arena dimension and the average body length which is needed for the analysis.
- `recording_info.mat`: Further information acquired during recordings, but not needed for analysis.

These files are stored according to *<Group size>*, *<Strain and day of fertilization>*, *<Day-post fertilization>* and *<Number of trial and body length in mm>* in the folder

```
..\<Group size>\<Strain and day of fertilization>
     \<Day-post fertilization>
         \<Number of trial and body length in mm>\segm\,
```

For example, `..\N2\WT20141126\day18\trial42_7mm\segm\` corresponds to trial 42 recorded using pairs of larvae/juveniles of a wild type strain with fertilization date 26/11/2014. The specific pair was 18 dpf old and had an average body length of 7 mm.

NOTE: Scripts cannot run properly if this folder structure is change!