

- **Figure 2C, D**

DeepLabCut model for tracking the flies position :

male_copulation_posture_model

Calculating the male copulation posture : reshape_dataset.ipynb

Plotting and statistics analysis : piezo_ratio_and_bunsan.R

- **Figure 2E**

DeepLabCut model for tracking the flies position :

male_copulation_posture_model

Calculating the male copulation posture and plotting : reshape_dataset.ipynb

- **Figure 3A**

Plotting and statistics analysis : cop_ratio.R

- **Figure 3B**

Plotting and statistics analysis : cop_ratio.R

- **Figure 3C**

Plotting and statistics analysis : cop_ratio.R

- **Figure 5C, H**

Plotting and statistics analysis : copulation_opt.R

- **Figure 5F**

DeepLabCut model for tracking the flies position :

male_copulation_posture_movement_model

Calculating the male copulation position : laser_opt_analysis.ipynb

Plotting and statistics analysis : laser_analysis.R

- **Figure 5G**

DeepLabCut model for tracking the flies position :

male_copulation_posture_movement_model

Calculating the male copulation position : laser_opt_analysis.ipynb

Plotting and statistics analysis : laser_analysis.R

- **Figure S2A-K**

DeepLabCut model for tracking the flies position :
male_copulation_posture_model
Calculating the male copulation posture : reshape_dataset_20-30.ipynb
Plotting and statistics : ratio_graph_drawing.R

- **Figure S3A**

Plotting and statistics : kick_copulation_analysis.R

- **Figure S3B**

Plotting and statistics : genital_touch_count_analysis.R

- **Figure S4A**

Plotting and statistics : activity_analysis.R

- **Figure S4B**

Plotting and statistics : fly_scale_analysis.R

- **Figure S5**

Plotting and statistics : copulation_mixing_assay.R

- **Figure S7A, B**

Plotting and statistics : copulation_opt_head_grooming.R

- **Figure S9B**

Calculating the male copulation posture : laser_map.ipynb

Plotting and statistics : laser_strength_analysis.R

- **Figure S14B**

DeepLabCut model for tracking the flies position :
male_copulation_posture_model
Calculating the DLC time : reshape_dataset.ipynb
Plotting and statistics : piezo_ratio_and_bunsan.R

- **Closed-optogenetic system for optogenetic assays with LED**

DeepLabCut model : copulation_detection_model_for_LED

Bonsai script : copulation_detect_LED.bonsai

Arduino script : Create_PWMstimu_bonsai_to_arduino_LED.ino,
StandardFirmata.ino

- **Closed-optogenetic system for optogenetic assays with a laser**

DeepLabCut model : copulation_detection_model_for_laser

Bonsai script : copulation_detect_laser.bonsai

Arduino script : Create_PWMstimu_bonsai_to_arduino_laser.ino,
StandardFirmata.ino