Updated on 5/9/24

**Analyzing behavior files for Maze 2.0 paradigm**

Required Software -

Python

<https://jupyter.org/>

Two Jupyter Notebook files:

* maze\_behav\_analysis.ipynb (group analysis)
* maze\_behav\_analysis\_individual.ipynb (individual analysis)

**Group Analysis (Run first)**

1. Update BEHAVIOR\patient cohort\participants.csv file with new subjects (subject id; exp\_version: non-contextual\_quiz\_after\_repetition; quiz\_feedback: 0; paradigm\_version: 2023\_1\_23).
2. In the *maze\_behav\_analysis.ipynb* notebook –
   1. Update paths for ‘pinfo’ (location of participants.csv file) and ‘dlist’ (location of participant raw data – ‘/BEHAVIOR/patient cohort/all\_patient\_data’ ) to match your file structure.
   2. Update ‘savepath’ variable for path to store saved participant csv files.
   3. Run notebook for analysis – Output is -
      1. Figures are saved in the run folder -
         1. Individual csv files –
            1. **output:** {participant}.csv

[Saved under R:\Shared\iEEG-Maze-NeuralDrift\behavior\behavior analysis\analysis]

* + - 1. ‘Plotting Quiz Accuracy Across Blocks for Each Participant’;
         1. Plots whether each quiz was answered successfully for each block and trial;
         2. **output**: ‘participant\_{participant}\_quiz\_accuracy.png
      2. ‘pic 1: event rt – plot the average in one plot’;
         1. Plots reaction time for different event types across repetitions;
         2. **output**: ‘rt by event types (dif reps).png’
      3. ‘pic 2 set: event rt – plot event separately by each mazeset/rep’; (Seems to be doing the same thing as 3.)
         1. Plots reaction time for different event types across repetitions;
         2. **output**: ‘rt by event types (dif reps.png’
         3. **output**: anova\_results.csv (I am not sure what this is)
      4. ‘pic 3: quiz accuracy for each rep’;
         1. Plots average quiz accuracy for each repetition across participants;
         2. **output**: ‘quiz accuracy (by rep).png’
      5. ‘pic 4: quiz accuracy for every block’;
         1. Plots average quiz accuracy for each mazeset across participants;
         2. **output**: ‘quiz accuracy (by mazeset).png’
      6. ‘pic 5: quiz precision for rep’;
         1. Plots average quiz precision for each repetition across participants;
         2. **output:** precision (by rep).png
      7. ‘pic 6: quiz precision for each block’;
         1. Plots average quiz precision for each repetition across mazesets
         2. **output: ‘**precision (by mazeset).png’
      8. ‘box plot that shows improvement across mazes (contextual quizzes)’
         1. Plots boxplot with average contextual quiz performance across repetitions
         2. **output:** ‘Contextual Quiz Performance by Repeition- patients(box – dotted mean, solid median).png
      9. ‘box plot that shows improvement across mazes (non-contextual quizzes)’
         1. Plots boxplot with average non-contextual quiz performance across repetitions
         2. **output:** ‘non-Contextual quiz performance by repetition (box).png’
      10. ‘event rt’
          1. Plots average reaction time across event types and repetitions
          2. **output:** ‘rt by event types (dif reps).png’
      11. **‘**normalize distance travelled per maze’
          1. Plots normalized distance traveled per repetition for each maze
          2. **output:** ‘Normalized Distance Traveled per Repetition for each Maze.png’
      12. **‘**plot accuracy for every mazeset’
          1. Plots average quiz accuracy by mazeset
          2. **output:** ‘quiz accuracy (by mazeset).png’
      13. **‘**plot accuracy for every mazeset (Serigne)’
          1. Plots average quiz accuracy by mazeset, but changed the axis labels and ticks
          2. **output:** ‘Contextual Quiz Performance by Repetition (dif mazesets).png’
      14. ‘Navigation Response Time (Violin Plot)’
          1. Plots average navigation response time for outset, decision point, and goal revealed
          2. **output:** ‘Violin Plot – Navigation Response Time’
      15. ‘RT Violin Plots for Outset, Neutral, Decision Points’
          1. Plots reaction time for outset, neutral, and decision points, across repetitions
          2. **output:** ‘Violin Plot – Outset Response Time’; ‘Violin Plot – Neutral Response Time’; ‘Violin Plot – Decision Response Time’
    1. Aggregated for all patients: patient\_data\_summary.csv (Summary of all patients data)

**Individual Analysis –**

use *maze\_behav\_analysis\_individual.ipynb*

1. Enter ID of subject you want to perform analysis for: ‘subjectid’
2. Update ‘pinfo’ and ‘dlist’ paths.
3. Update ‘filepath’ to location of saved participant csv files (which were generated from the group analysis notebook)
4. Run notebook for analysis.
5. Output –
   1. **output:** ‘{subject}\_average\_quiz\_accuracy\_vs\_repetition.png’
      1. Plots average quiz accuracy vs. repetition for each participant
   2. **output:** ‘Average Reaction Time vs. Block and Trial Numbers
      1. Plots average reaction time vs block and trial
   3. **output:** ‘Total time spent by {subject} in each location
      1. Plots total time spent by each subject in each coordinate location