**To run the MFTM task (fMRI version):**

* Instruction: “This is an experiment investigating attention. You will be shown 5 arrows on the screen pointing left or right. Your task is to indicate the direction in which the majority of the arrows point. You should indicate "Left" by pressing the button under your left index finger if the majority of the arrows point left, or "Right" by pressing the button under your right index finger if the majority point right. After the arrows appear, they will be masked with double-arrowheads. You will have a short window after the onset of the arrows in which to make your response. Accuracy is the most important goal in this task. Please try to be as accurate as possible. If you are not sure about the correct answer, please guess. Notice: please make sure to make response in every trial. After each trial, you will be told whether you answered correctly or not.”
* Task programs are made using Eprime 2.0.10. Eprime version as 2.0.10 or higher is required to run the task.
* In the “MFTM\_PackageTaskProgram/fMRI\_program” folder, the files named “MFT-M3\_training\_2014\_03\_21” (.ebs and .es2) are for the behavioral practice before the formal task, which contain 4 runs with 5 min for each run. Response buttons are “f” for left and “j” for right.
* The files named “MFT-M3\_fMRI\_2014\_03\_21” (.ebs and .es2) are for the formal fMRI task, which contain 12 runs with 5 min for each run. Response buttons are “2” for left and “7” for right. The trigger from the scanner is “=”.

**To analysis the behavioral data:**

* In the eprime .edat files as the output, please see the column “ArrowRatio” for the ratio between arrows pointing to the majority and minority directions, “SOA” for the exposure time (in unit of ms), “SlideTarget.ACC” for response accuracy (1: correct, 0: incorrect), “SlideTarget.RT” for reaction time.
* To estimate the capacity of cognitive control (CCC):
  + If you have multiple participants, please use the Emerge program to merge the .edat files into one .emerge file.
  + Open the .edat file (for one participant) or .emerge file, select ‘File -> Export” and select excel format to export the data into a .txt file.
  + Open the .txt using Excel, and save it as a .xlsx file.
  + Set the folder containing .m files into the Matlab path.
  + Use the function “MFTM3\_xls2mat” to convert the .xlsx file into .mat files.
  + For each participant, use the function “MFTM3\_capacity\_MLE” to calculate the mean accuracy, RT, and efficiency (as accuracy/RT, with RT in unit of second) for each condition, and estimate the CCC (in unit of bit per second).
  + To visualize the results, use the function “MFTM3\_plot”.
  + Please see the help information for these functions for details.