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Funamizu, Kuhn, Doya (2016) Nat Neurosci
Neural substrate of dynamic Bayesian inference in the cerebral cortex

Explanation of online-available data.
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Data is stored in MatLab format .mat. Each file contains data of one session.
Scanning rate of the two-photon microscope was 30.9 Hz. Behavioral and imaging data are aligned to the frame-scan rate.

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Behavioral data
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analyze_trials

Number of successful trials. Non-reward trials were removed. Trials in which mice took more than 20 seconds to get reward were also removed.

state

Condition of each successful trial:

0, continuous condition; 1, intermittent 1 condition; 2 intermittent 2 condition.

goal

Goal position in successful trials. The position of the mouse during the auditory virtual navigation task is given by a pixel values. The pixel value is converted into cm by multiplying with 36/430.

number_frame

Number of frames in successful trials.

reward_scan

Reward time. At this time a water reward is given (two drops of sugar water per successful trial).

spk_scan

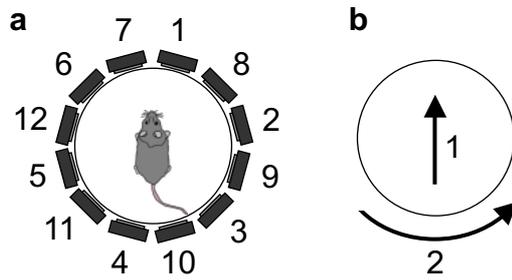Onset time of speakers in each trial. Position of each speaker can be seen in **Fig. 1a**.

Figure 1. Setup.
a. Position of speakers.
b. Rotations recorded with an optical computer USB mouse.

spk_scan_down

Offset time of speakers in each trial.

spk_on_off

On/off of sound in each frame.

move_scan_raw

Rotation of spherical treadmill detected with an optical computer USB mouse (pixel). First column is the rotation parallel to the mouse's body axis. Second column is the rotation vertical to the mouse which is not used in the task (**Fig. 1b**). move_scan_raw shows the locomotion of the mouse in the real environment. Locomotion is not measured during inter trial interval (ITI) (during the last about 100 frames).

move_scan

move_scan (pixel) shows the locomotion of the mouse in the acoustic virtual environment. First column is used for the movement in the task.

speed_scan

Locomotion speed of mouse (pixel/s). Speed is defined as the movement in the last 1 s. Speed is not analyzed in the last about 100 frames during ITI. speed_scan was used for the regression analysis in Fig. 3b.

lick_scan

Licking frequency (Hz) with the maximum frequency of 10 Hz. Especially during water acquisition, mice sometimes widely opened their mouth to lick rapidly, which sometimes turned the infrared sensor for lick detection continuously on. This rapid

licking was defined as 10-Hz licking. lick_scan was used for the regression analysis in Fig. 3b.

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Imaging data
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Image_data

Image of the recorded field of view. Intensity of each pixel was averaged over the complete trial. The image is normalized (0 to 1).

Trace_count

Number of active neurons.

Region_trace

XY location of active neurons in a field of view of 512 x 512 pixels (400 x 400 μm). Values correspond to the number of the corresponding active neuron.

X_plot_all

X axis of circumference of each active neuron.

Y_plot_all

Y axis of circumference of each active neuron.

Neuron_trace_raw

Original trace values (R) of active neurons in successful trials. R is the ratio of the green (GCaMP6f) and red (Turbo RFP) channel.

Neuron_trace

$\Delta R/R$ of active neurons.