Supporting information for Imamizu *et al*. (2003) *Proc. Natl. Acad. Sci. USA*, 10.1073/pnas.0835746100.

Kinematics of the Cursor, the Mouse/Hand, and the Target Movements During the Tracking Task

To check whether the activation increase in the test periods could be attributed to differences in motor performance between the test and the baseline periods, we investigated the detailed kinematics of the cursor, the mouse/hand, and the target movements. The cursor and the mouse/hand movements were related to hand motor performance. The target (and also cursor) movements displayed on the screen were related to visual motion and eye movements.

The cursor (x_c, y_c) and target (x_t, y_t) positions were sampled at 60 Hz. Mouse positions (x_m, y_m) were reconstructed from the cursor positions afterwards. Tangential velocity $(\sqrt{\dot{x}^2 + \dot{y}^2})$ and acceleration $(\sqrt{\ddot{x}^2 + \ddot{y}^2})$ were calculated for the cursor, the target, and the mouse.

Table 2 shows the kinematics in the experiment where activation patterns were investigated between each novel mouse (in the test periods) and the normal mouse (in the error-equalized baseline periods). In any comparison between the test and the baseline periods, the velocity and acceleration in the baseline periods were significantly larger than those in the test periods.

These results suggest that activation increase in the test periods cannot be attributed to mouse/hand movements, visual motion, or eye movements. Because we compared activation patterns of the rotated mouse and the velocity mouse after subtraction of the corresponding baseline activity, the difference in the activation pattern also cannot be attributed to the difference in the mouse/hand movements, visual motion, or eye movements between the novel mice.