**Method.**

a stroke patient(39 years old) and 9 control subjects(mean age:40.7 , SD:2.1) were included in this case study.

Resting-state fMRI(rs-fMRI) images were obtained using 3T scanner, GE Signa Hdxt for patient and GE Discovery MR750W for control group, at Kyungpook National University Medical Center, Korea. A 8 channel and 24 channel head coils were used for each patient and control group. During the rs-fMRI scan, 240 volumes of images were acquired with TR = 2000 ms / TE = 30 & 40 ms / slice thickness = 4mm / acquisition matrix = 64x64. High-resolution structure brain images were also acquired using 3D Brain volume imaging (BRAVO).

Rs-fMRI data were preprocessed by FSL toolbox(<https://fsl.fmrib.ox.ac.uk/fsl/fslwiki/>). Using FEAT of FSL, the following steps were performed: motion correction (MCFLIRT), brain extraction (BET2), temporal filtering, spatial smoothing (FWHM:5mm). Also, spatial transformation, linear transformation (FLIRT) and nonlinear transformation (FNIRT), was taken for all subject. Additionally, 3D lesion mask was drawn based on T1-high resolution structural image for more accurate registration to the patient. The spatial transformation was performed with inverted lesion mask in the case of patient

The auditory, sensory and motor area were chosen for analysis. Regions of interest (ROIs) with the sphere of 5mm were made for each area on the MNI152 template: Primary auditory (L: -46, -21, 10 / R: 46, -20, 10), association auditory (L: -54, -34, 14 / R: 58, -26, 12), primary sensory (L: -40, -28, 46 / R: 42, -28, 46), association sensory (L: -40, -12, 18 / R: 42, -10, 18), multimodal sensory (L: -52, -32, 32 / R: 52, -34, 34), primary motor (L: -36, -18, 48 / R: 38, -18, 46), association motor (L: -6, -2, 56 / R: 6, -4, 56)

For each subject and each region, temporal data of preprocessed rs-fMRI was extracted and each 9 control subjects was averaged to one value. Pearson’s correlation coefficient between regions was calculated and it was compared between case and control group. ‘Seaborn’ library of Python was used for correlation matrix.