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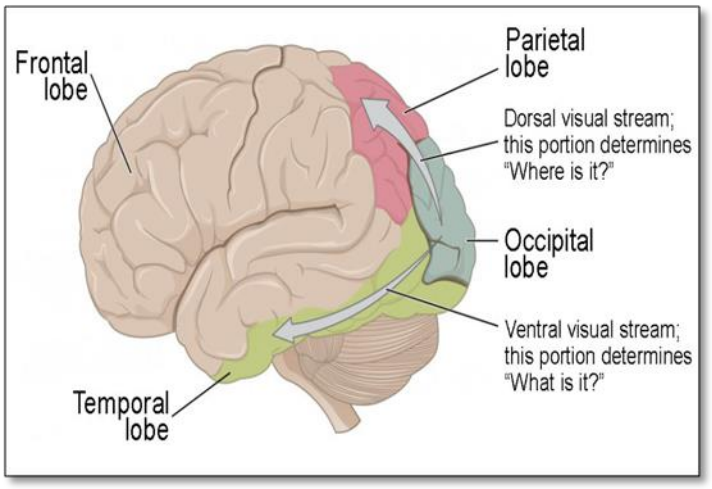
Grey matter: A new way to understand vision and action

By Dr Bilqeesa Bhat

Scientist at National Brain Research Centre (NBRC), Department of Biotechnology's autonomous institute has addressed several unresolved questions regarding the visual perception and action. The research has tried to debunk several aspects of a 40 year old 'Visual Dual-Stream theory' using Functional Magnetic Resonance Imaging (fMRI) recordings on healthy human volunteers.

The fMRI measures brain activity by detecting changes associated with blood flow. It has been seen that when an area of the brain is in use, blood flow to that region increases. The fMRI scans were repeated after seven practice sessions conducted in a non-MRI environment to investigate the effects of changes in the brain activity.



Earlier studies have explained that the dorsal brain areas (situated on situated at the back side of head) are linked to visuo-motor movement motion perception, and ventral regions (front or lower side of head) to visual cortex are associated with color, object, shape and face processing.

Present study demonstrates that neither of these views completely describes the selection of brain regions for visual processing, i.e., brain's ability to use and understand visual information. The data driven modeling and machine learning approaches helped the scientists to explain how large scale network processing makes visual perception and visually guided action tasks. Researchers found that cross stream interactions and role of inhibition are very critical for visual perception.

Furthermore, the study established that earlier views on information processing cannot sufficiently capture the functional brain activations and connectivity. It also showed that visual information is processed by a highly interconnected brain network in which inter-connections between different parts of brain play very important roles.

The research work has been accepted by reputed journal *Journal of Cognitive Neuroscience* for publication. Dr. Dipanjan Ray's research team has shown that any network organization is plastic and susceptible to change post learning/development.

Contact person:
Dr. Dipanjan Ray,
dipanjan@nbrc.ac.in,
NBRC, Manesar