Study Of Human Brain Through Segmentation Of Brain Lobes

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Abstract:

PET and fMRI are allowed for imaging of the brain without disturbing it, and they are important tools in clinical diagnosis. These are also used for cognitive investigation for the working of the healthy brain. Naturally, the main focus of investigation is the cerebral cortex. In this paper, we try to simulate brain structure through economics model.

KeyWords: Brain Image, MRI, Human Behavior and Edge Detection

1. Introduction:

Cognitive imaging implies imaging the brains of the subjects in two experimental conditions, and comparing the activity in the two conditions of the brain. The regions in the brain where there is a different between the activities in the two conditions are then assumed to mark regions of cognitive processes that are different between the conditions.

An important assumption of cognitive imaging interprets of these studies is that when a differential activity shows in one study, it is replicable and hence generally applicable. In other words, it is expected that this differential activity is common to all healthy humans. This assumption is based on humans have a common cognitive architecture, and that the cognitive imaging data reflects the characteristics of this architecture.

Gray scale image and Binary image are two important variations among digital images. In a gray scale image a particular pixel takes a intensity value lying between 0 to 255 where as a binaryimage it could take only two values either 0 or 1.The procedure to convert a gray scale image into a binary image is known as image binarization. Image

binarization has wide popularity in many research areas especially in case of document image analysis, medical image process and scene processing.

Cell firing is done by the sensory system through a threshold value and an action is immediately triggered whether it exceeds threshold value. The economic model is written in MATLAB for optimum threshold for normal behavior.

Our method explained in a unified framework through behavioral economics for improving psychological nature of the human being. This is possible since human brain actually controls the nature of the human being.

The objective of this paper is to offer a brain-based economic model of information processing that builds on evidence from neurobiology. Accordingly there are five basic principles in the physiological mechanisms of information processing. Initially, neurons carry information away from the sensory system using an imperfect encoding technology.The level of neuronal cell firing depends stochastically on the information obtained.Second, an action is triggered when the cell firing activity in favor of one alternative reaches a certain threshold. Third, neuronal activity responds to changes in payoffs and beliefs, that is, neurons compute approximately the 'expected value'associated to each alternative. Fourth, neurons also perform approximately 'Bayesian' inferencesconditional on the data retained. Fifth and crucial for our purpose, the triggering threshold can be modified, and this affects how the evidence is interpreted. Our paper is structured as next section describes the basic anatomy of the brain, then human behavior model and finally our proposed method and algorithms.

2. Behavioral Economics

"Stigler (1965) says economic theories should be judged by three criteria: congruence withreality, generality, and tractability. Theories in behavioral economics should be judged this waytoo. We share the positivist view that the ultimate test of a theory is the accuracy of itspredictions.3 But we also believe that, ceteris paribus, better predictions are likely to result fromtheories with more realistic assumptions".

People do have the capacity to override emotional responses. This

capacityrelies in large measure on the most recently evolved parts of our brains that supportforms of behavior that are more recognizably rational. Neuroscientists are beginning to make headway in identifying the neural mechanisms involved in bothemotional responses and higher cognitive processes. This effort offers the promiseof a deeper understanding of how and why emotions impact decision making, howthis may contribute to behavior that appears to deviate from optimality, and howand when we are able to overcome such emotional responses.

Theories in behavioral economics are generality – e.g., by adding only one ortwo parameters to standard models. Particular parameter values then often reduce the behavioralmodel to the standard one, and the behavioral model can be pitted against the standard model byestimating parameter values. And once parameter values are pinned down, the behavioral modelcan be applied just as widely as the standard one.

The rejection of academic psychology by economists, perhaps somewhat paradoxically, began with the neoclassical revolution, which constructed an account of economic behavior built up from assumptions about the nature—that is, the psychology—of homo economics. At the turn of the 20th century, economists hoped their discipline could be like a natural science. Psychology was just emerging at that time, and was not very scientific. The economists thought it
provided too unsteady a foundation for economics. Their distaste for the psychology of their period, as well as dissatisfaction with the hedonistic assumptions of Benthamite utility, led to a movement to expunge the psychology from economics.

Experiments played a large role in the initial phase of behavioral economics becauseexperimental control is exceptionally helpful for distinguishing ehavioral explanations fromstandard ones. For example, players in highly anonymous one-shot take-it-or-leave-it"ultimatum" bargaining experiments frequently reject substantial monetary offers, ending thegame with nothing.

3. Brain Anatomy and Proposed Method

The primary goal of brain image behavior is to partitiona given brain image into non-intersecting regionsrepresenting true anatomical structures such as grey matter,white matter, etc. Over the last decade, many methods havebeen proposed to tackle this problem.

Inspite of this progress, automatic behavior of

brainstructures remains a very challenging task. This paperpresents a new hybrid method which integrates multi-scaleanalysis, image normalization and elastic templatedeformation.

Methods for performing behavior vary widely depending on the specific application, imaging modality,and other factors. For example, the segmented of braintissue has different requirements from the segmentation of the liver. General imaging artifacts such as noise, partialvolume effects, and motion can also have significantconsequences on the performance of algorithms.

The Preprocessing is used for loading the Input MRI images to the MATLAB Environment and also it removes any kind of noise present in the input images. In preprocessing the first step is to load the MRI image data set on to the MATLAB workspace.

Among the most recent and exciting developments in neuroscience has beenthe introduction of methods for imaging the function of the intact human brain.This in turn has opened up the opportunity to study the involvement of the brainin uniquely human activities, such as reasoning and complex forms of decisionmaking. These studies provide support for a view of the brain as a confederation ofsystems and behavior as the outcome of an interaction among these. For the most part these systems work cooperatively to guide behavior. When disagreements of human behavior arise then behavior reflects the outcome of a competition among systems. Suchcircumstances are illuminating, as a way for identifying the functions of componentmechanisms (that ordinarily work seamlessly together and are therefore difficult todistinguish) and by providing a possible explanation for apparent anomalies inbehavior. Some of the systems in the brain—including ones that have consistentlybeen associated with emotional processing

The brain is made of three main parts: the forebrain, midbrain,and hindbrain. The forebrain consists of the cerebrum, thalamus, and hypothalamus (part of the limbic system). The midbrain consists of the tectum and tegmentum. The hindbrain is made of the cerebellum, pons and medulla. Often the midbrain, pons, and medulla are referred to together as the brainstem.

The cerebrum or cortex is the largest part of the human brain, associated with higher brain function such as thought and action. The cerebral cortex is divided into four sections, called "lobes": the frontal lobe, parietal lobe, occipital lobe, and temporal lobe. Here is a visual representation of the cortex [Figure 1].

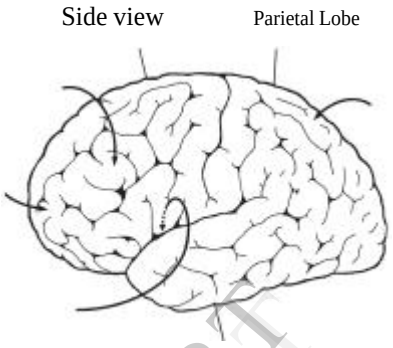

Figure 1The Human Cerebrum

In contrast, a considerable body of evidence indicates that our higher cognitivefaculties, including deliberative thought, abstract reasoning, problem solving, planning and language all rely heavily on additional brain structures. One set that isalmost universally implicated in such higher-level processes includes anterior anddorsolateral regions of prefrontal cortex, lying along the upper and front mostsurfaces of the frontal lobes (Duncan, 1986; Koechlin et al., 1999;

The total process is as follows:

1. Input a normal human brain image.
2. Divided the normal human brain into two halves (vertically). We will get two halfhemispheres.
3. Find the edge detectionof each part ofthe content of each hemisphere to separate each part as mentioned above to get knowledge about the behaviour of the human whose image is to be analyzed.
4. Proceed same for the other hemispheres of the brain.

5. Proceed step 2 to 4 & compare between two and if found each part of the brain then it is stored an two dimensional array for further processing.

7. Stop

4. Conclusions

The studies described above illustrate two of the central points of this article.First, a variety of decisions—ranging from moral judgments to economic choices can engage emotional responses thought to be highly conserved by evolutionarypressure. These mechanisms may be well-adapted to some circumstances, but inothers introduce inconsistency and in some cases.

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