

## MODELING HUMAN DOUBT TO CREATE DECISION ANALYZER FOR A ROBOT

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### ABSTRACT

The concept of human doubt as a suspense between two or more contradictory propositions covers a range of phenomena: on a level of the mind, it involves reasoning, examination of facts and evidence and on an emotional level, believing and disbelieving. False tagging theory (a neuroatomical model of belief and doubt processes) asserts that the prefrontal cortex is critical for false tags during the assessments of beliefs. The juxtaposition of a false tag on a “Perceptual cognitive representation (PCR)” which refers to any belief substrate that creates a dispositional doubt for the particular belief receiving the tag and FTT affirms that the prefrontal cortex performs the singular function of false tagging for disparate modalities which compete for these resource in a flexible manner. In our bid to explore the concept of doubt in the human brain, brainwave signals (a bioelectric phenomenon reflecting activities in the human brain) is measured using Electroencephalography. The EEG data used in this project was simulated using SEREEGA (A Matlab toolbox for simulating Event-Related EEG) to reflect the doubt activities (a function of prefrontal cortex) in the human brain. During the modelling process of the EEG data, MATLAB programming language was employed and EEGLAB and BCILAB Matlab toolboxes are used. The EEG data is subject to features extraction and classification. Linear Discriminant Analysis (LDA) is the machine learning technique used for classification and Area under ROC is the performance metric used and we achieved a classification accuracy of 95% which has been able to meet the needs of real applications.

**Keywords:** Doubt, False Tags, False Tagging Theory, EEG, Feature Extraction, Classification.