

# Wavelet based EEG Signal Analysis and Classification

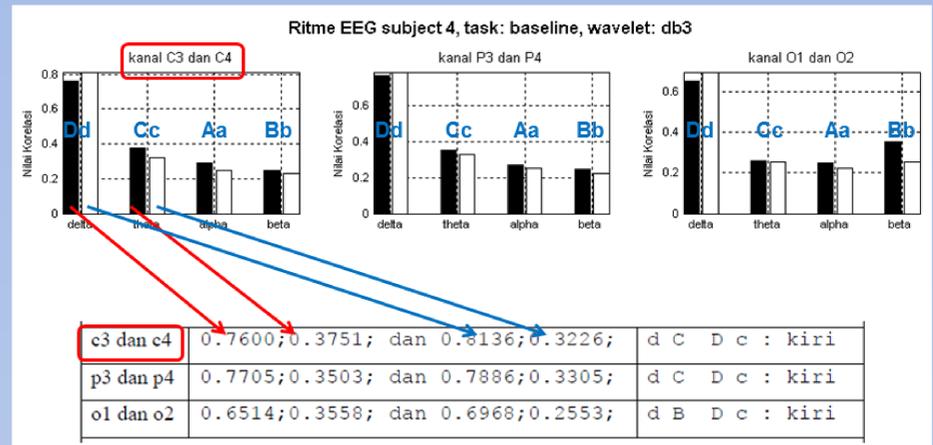
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## EEG Data Analysis for Some Conditions using Wavelet Based Decomposition and Correlation (2010)

EEG data which have been analyzed here are from three students age range from 20 to 30 years (hereinafter called the subject 3, 4 and 5). Each subject had five activities, namely **baseline, multiplication, letter-composing, rotation** and **counting**. Data were analyzed with Daubechies 3 and Coiflet 3. The analysis showed that subjects 3 more dominant in his right brain activities while subjects 4 and 5 subjects are left brain dominant.

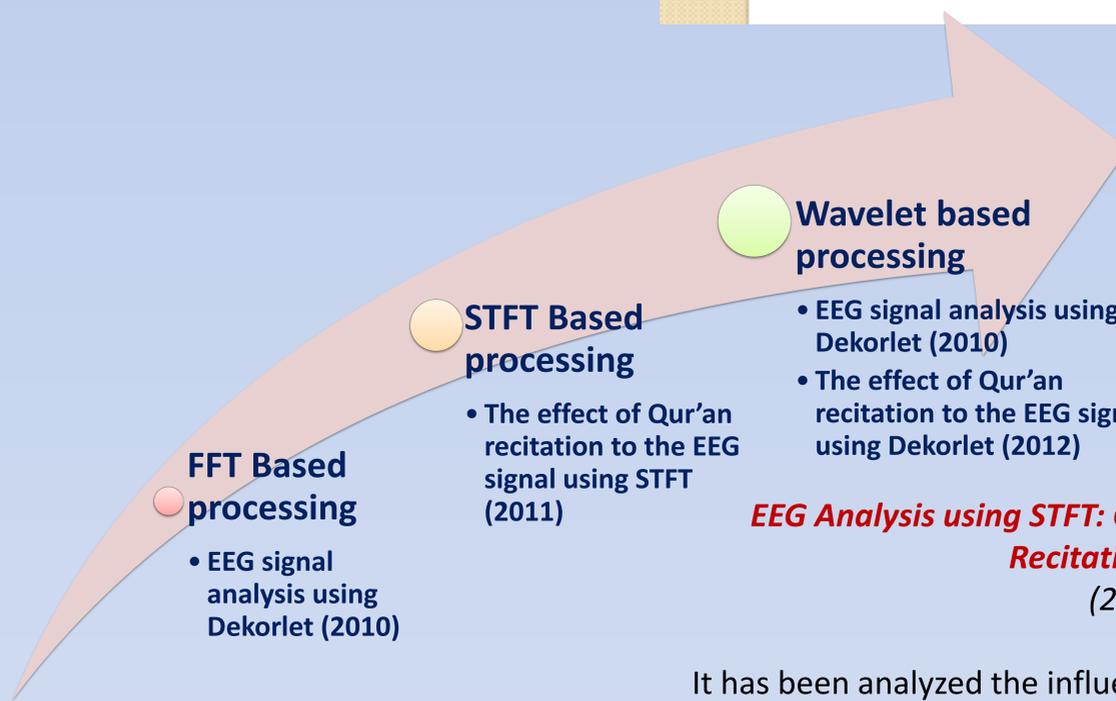
The appearance of beta waves in the occipital lobe 5 subject demonstrate the possibility of abnormalities in the occipital or temporal lobe. Users with the dominant right brain activity over the parietal lobe activate the role, whereas in subjects with left hemisphere dominance over the occipital lobe activate the role. Dekorlet method capable of extracting the information dominance of the brain wave frequencies, the difference results from the mother wavelet Daubechies 3 and Coiflet 3 less than 3% (0.03).



Tabel 4: Hubungan dominasi daerah perekaman dan dominasi belahan otak

Kondisi	Subjek 3	Subjek 4	Subjek 5
<b>Daubechies 3</b>			
Baseline	Parietal – kiri	Central – kiri	Occipital – kiri
Multiplication	Parietal – kanan	Occipital – kiri	Occipital – kiri
Letter-composing	Parietal – kanan	Central – kanan	Occipital – kiri
Rotation	Parietal – kanan	Occipital – kiri	Occipital – kanan
Counting	Parietal – kiri	Occipital – kiri	Occipital – kanan
<b>Coiflet 3</b>			
Baseline	Parietal – kiri	Central – kiri	Central – kanan
Multiplication	Parietal – kanan	Occipital – kiri	Occipital – kiri
Letter-composing	Parietal – kanan	Central – kiri	Occipital – kiri
Rotation	Parietal – kanan	Occipital – kiri	Occipital – kanan
Counting	Central – kiri	Occipital – kiri	Occipital – kiri

**Vision Function**



## EEG Analysis using STFT: Case Study for The Al Quran Recitation Effects (2011)

It has been analyzed the influence (effects) of Al Quran recitation in EEG recordings using **Short Time Fourier Transform (STFT)**. The data which has been analyzed is EEG recordings of 5 men aged 20-30 years. Each subject experienced three stages of treatment, silent condition, listening to the recitation of the Al Quran, and then silent condition again.

EEG recording for each subject is 30 minutes long. However, the data which has been analyzed is the transition between silent condition and listening to the Al Quran recitation, its about at time 8 to 10 minute. The data then analyzed using STFT based on Hamming Window with length of 128. The results shows for all the subjects which indicates the right brain activities, dominated by delta wave, and after listening the Al Quran reading, the power of delta wave is increase. Beside delta wave, there are also appear theta dan alpha waves. The verses of the Al Quran which is read in the treatment are Al A'raaf 40-47, Al Baqarah 255-257 and 285-286.

