

AUDIO-VISUAL ENTRAINMENT APPLICATION IN SMART ENVIRONMENT FOR USERS' PSYCHOPHYSIOLOGICAL RESPONSE METHODOLOGICAL STUDY



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JUBILEE SCIENTIFIC CONFERENCE

NEUROSCIENCE — FROM THEORY TO EXPERIMENT

SOFIA, BULGARIA



04.12.2014

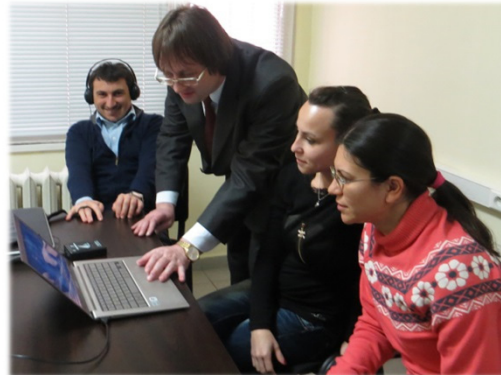
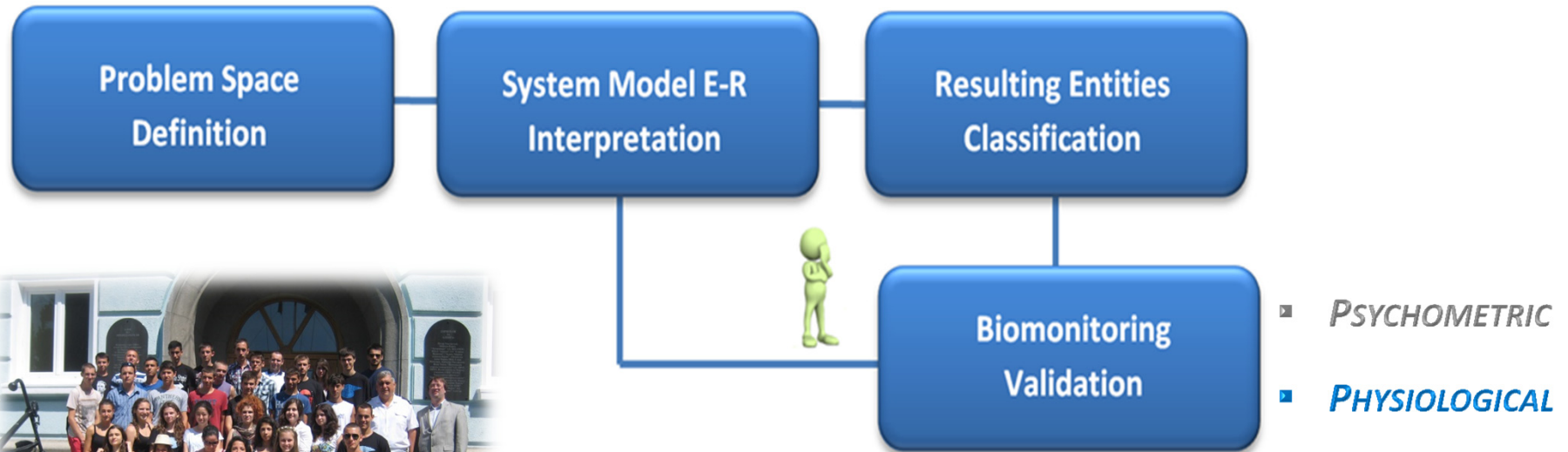
DIGITAL SMART ENVIRONMENT & RESILIENCE



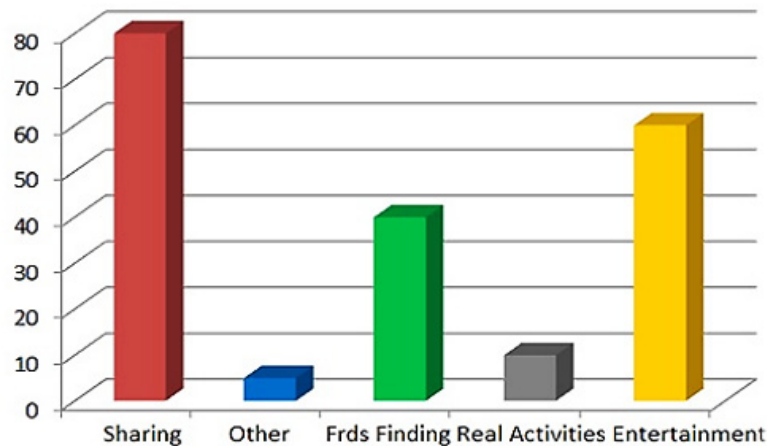
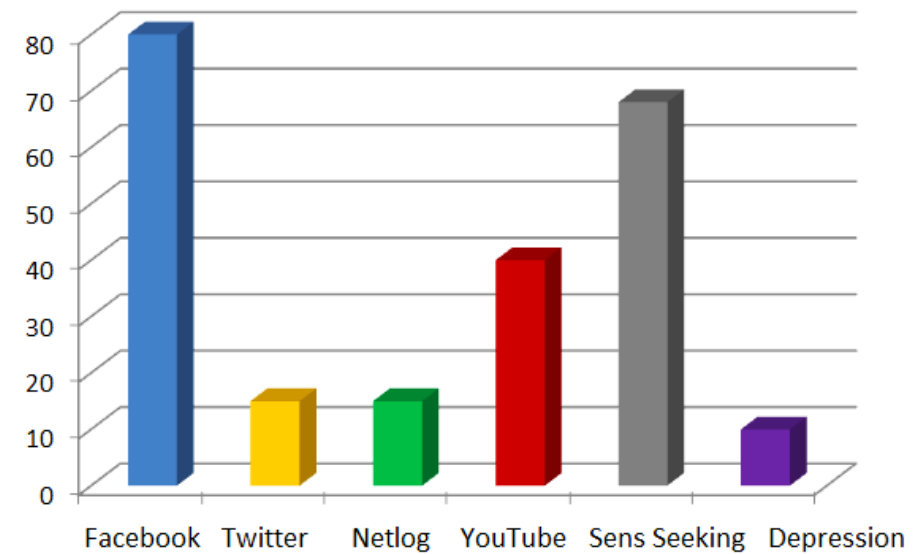
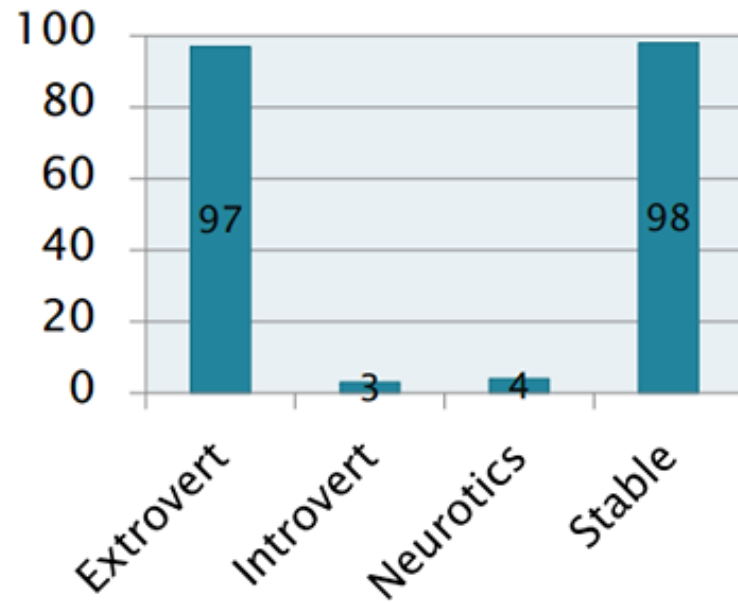
...!?



RESEARCH MODEL & EXPERIMENTS SET-UP



IMPLEMENTED PSYCHOMETRIC MEASUREMENTS



Q-BASED SURVEYS UNDERSTANDING...?

- ☐ EYSENCK PERSONALITY TEST
- ☐ VON ZERSEN'S DEPRESSION SCALE
- ☐ ZUCKERMAN'S SENSATION SEEKING SCALE

AV ENTRAINMENT STIMULATION

Left 14-10 Hz

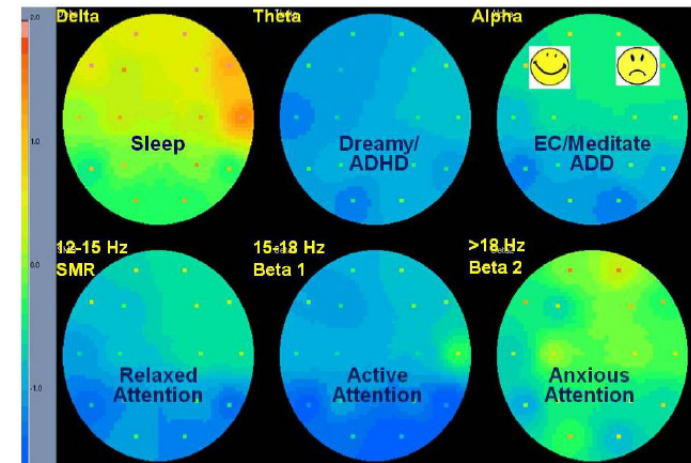
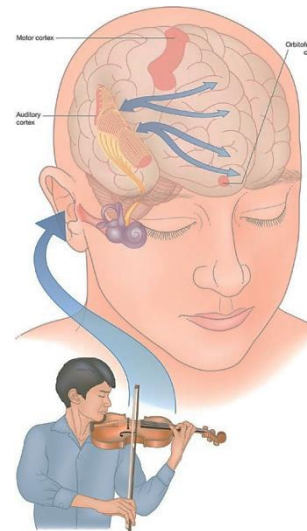
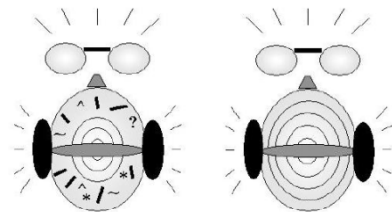
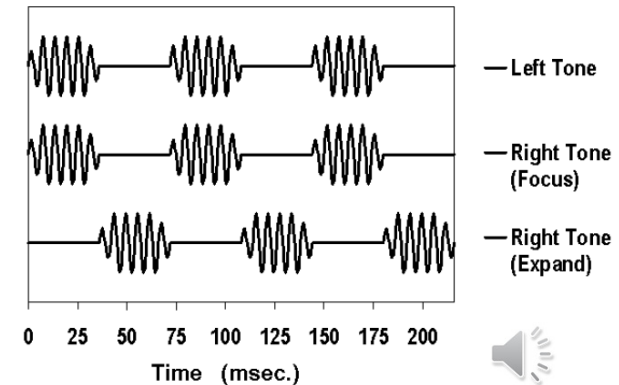
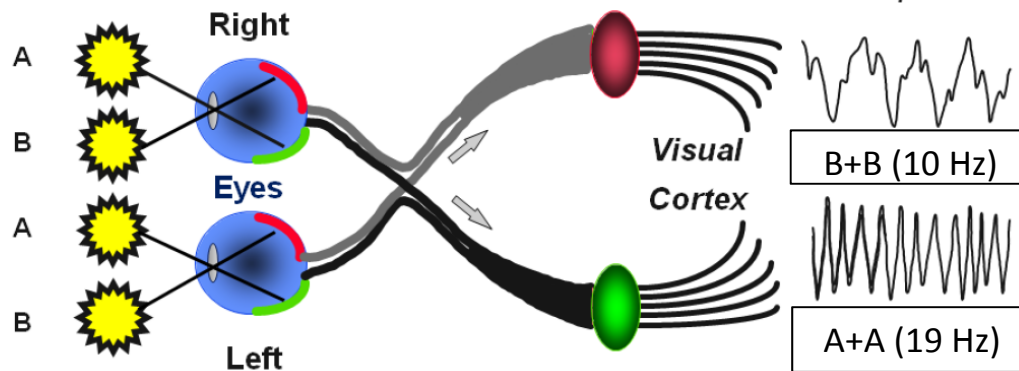
A OFF ON OFF



Brain Booster Session

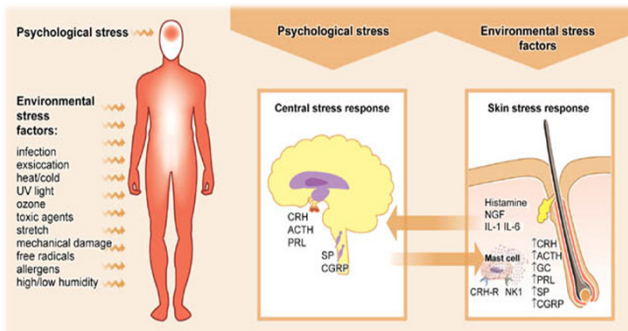
Right 19-10 Hz

B OFF ON OFF



SKIL Data Base

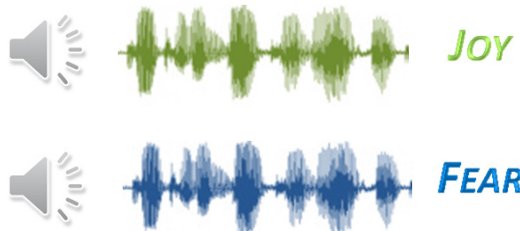
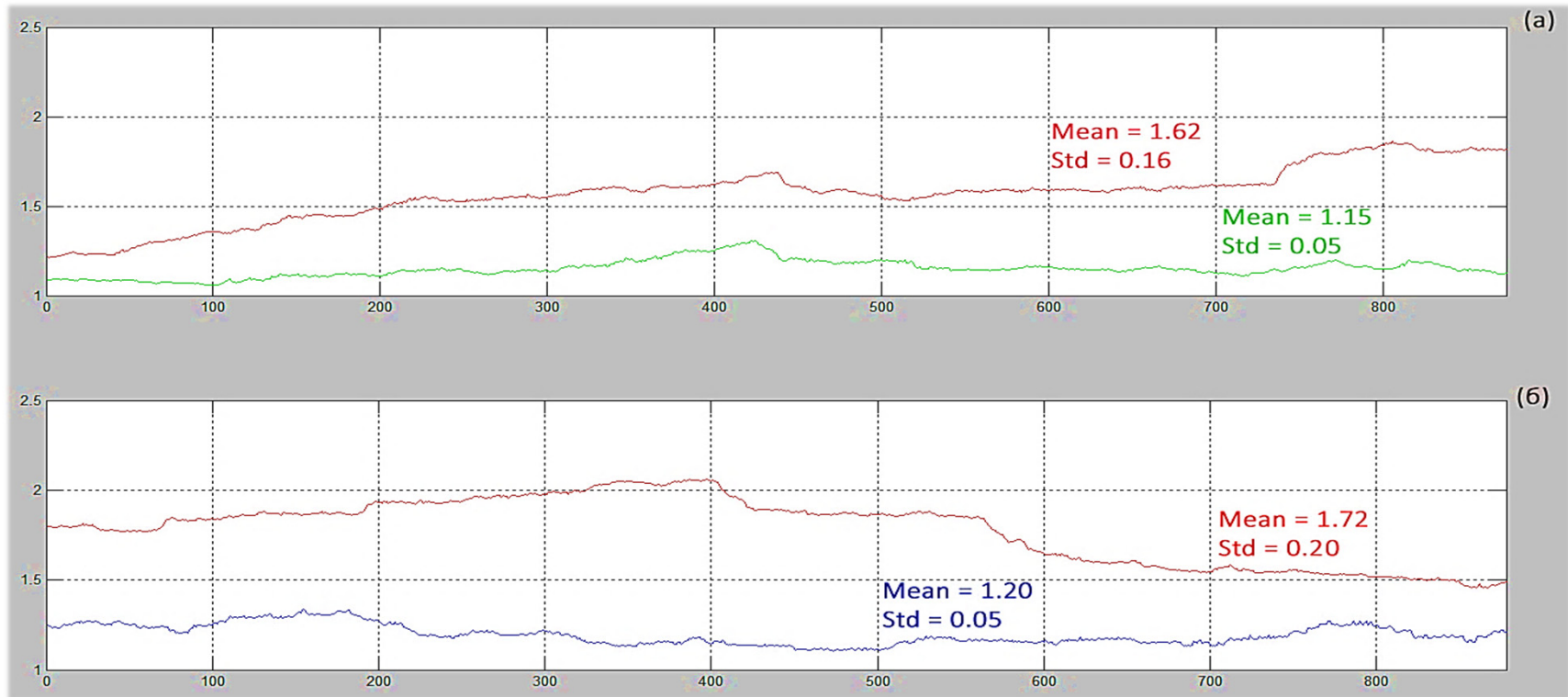
Brain-skin crosstalk



MULTIMEDIA & GSR RESPONSE

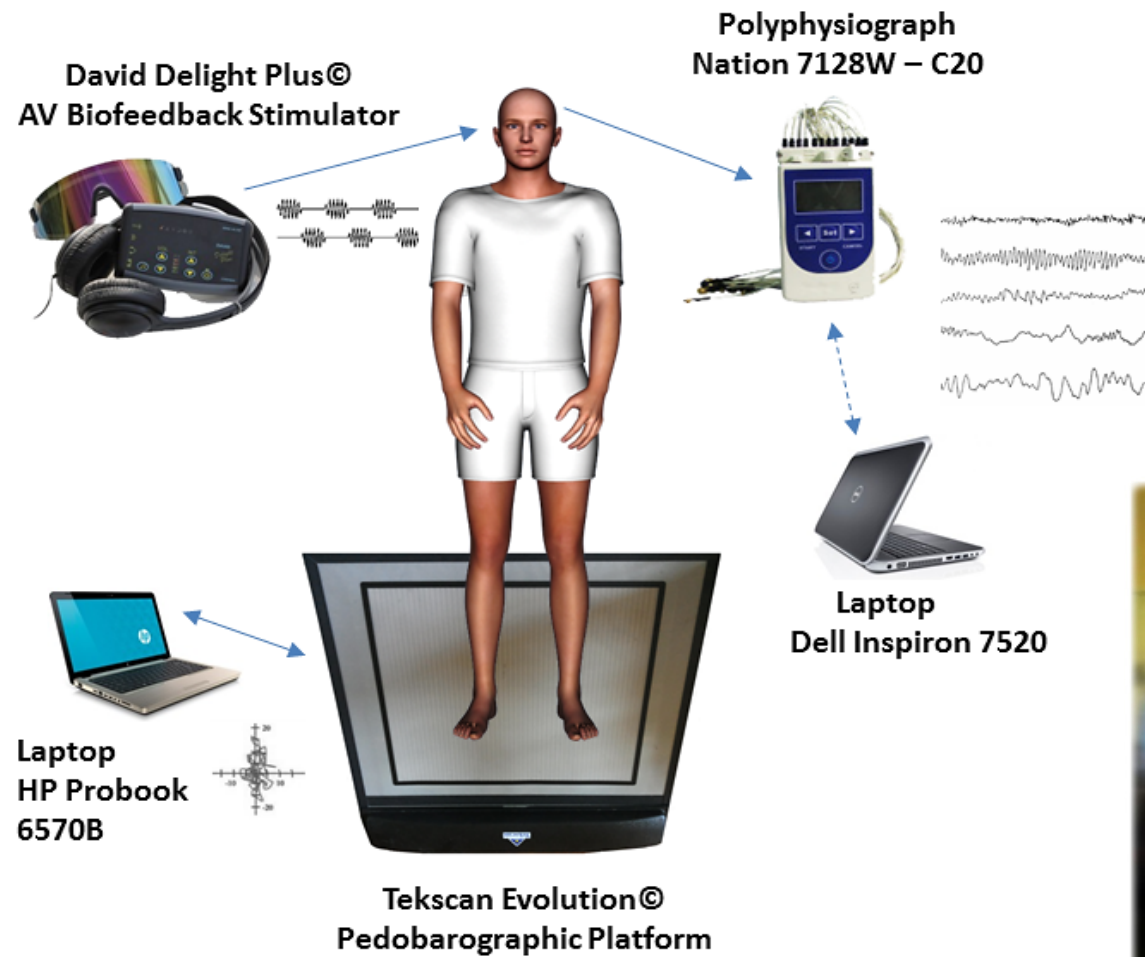


GSR HFD RESULTS



95 % correlation with
IADS emotions
classification

AVE EEG & POSTURAL DYNAMICS

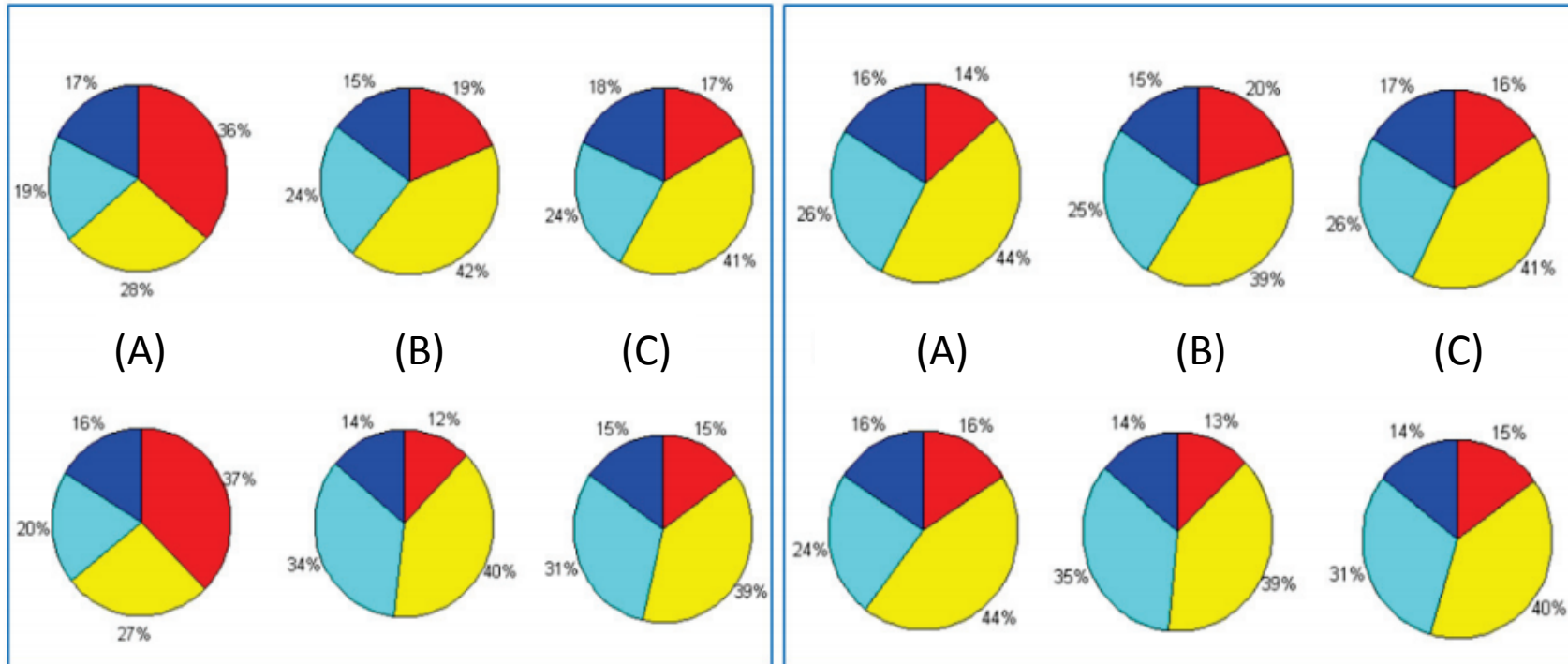


EEG RESULTS

RELATIVE FOURIER PS

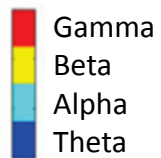
C3 EYES OPENED

C4 EYES OPENED



C3 EYES CLOSED

C4 EYES CLOSED

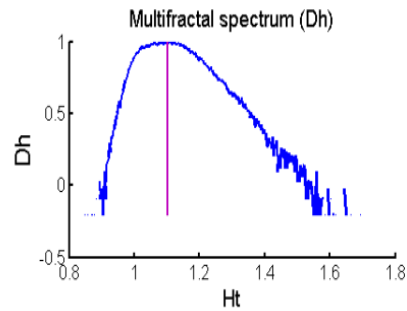


(A) - Before AV Stimulation
(B) - 10 min after AV Stimulation
(C) - 30 min after AV Stimulation

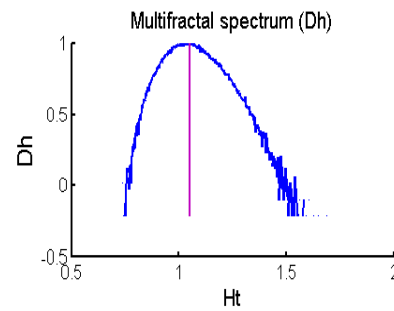
MULTIFRACTAL SPECTRUM

EYES OPENED

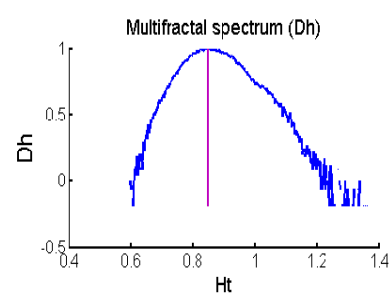
C3 Before Stimuli



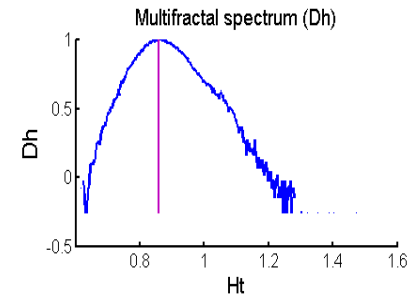
C4 Before Stimuli



C3 10 min after AV Stimulation



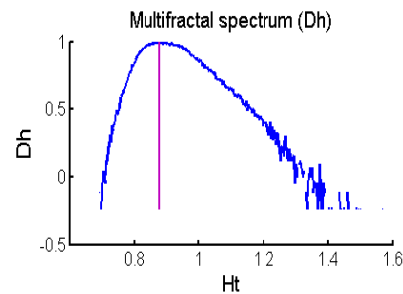
C4 10 min after AV Stimulation



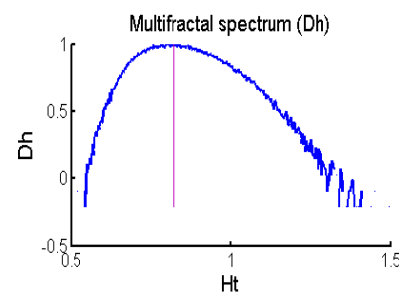
Ht = 0.7 - 1.5 -> Ht = 0.5 - 1.3

EYES CLOSED

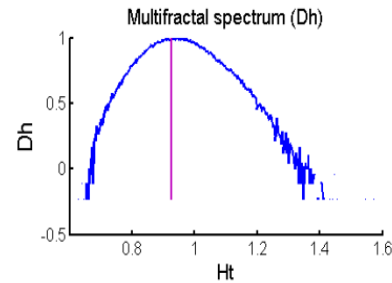
C3 Before Stimuli



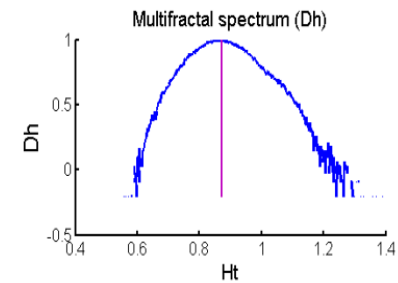
C4 Before Stimuli



C3 10 min after AV Stimulation



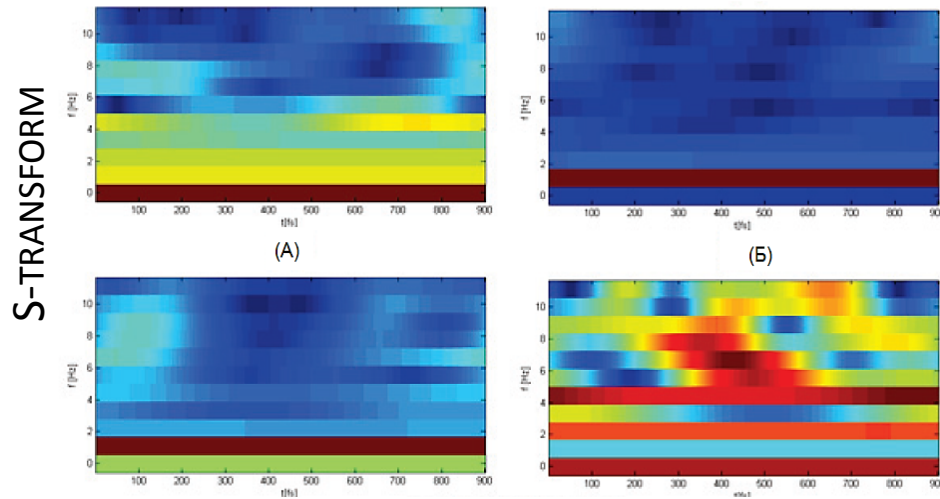
C4 10 min after AV Stimulation



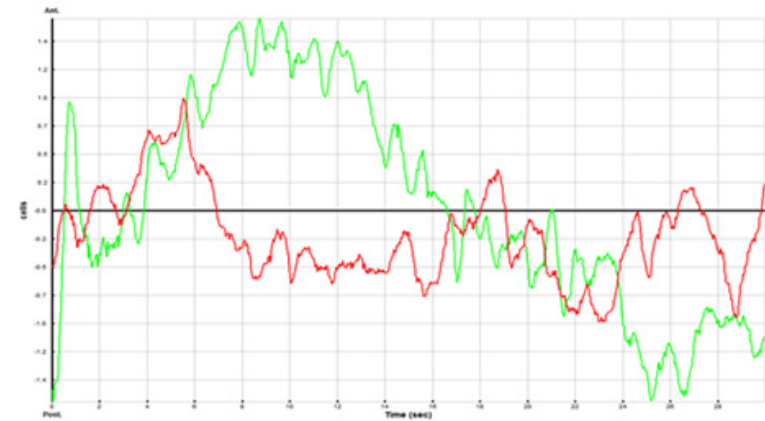
Ht = 0.5 - 1.5 -> Ht = 0.6 - 1.3

STABILOGRAM A/P RESULTS

(A) EYES OPENED (B)

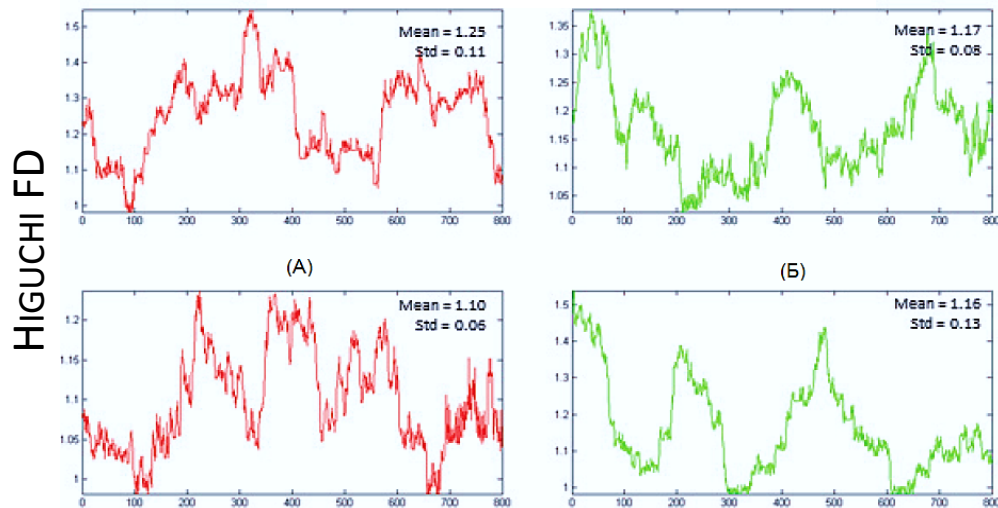


A/P COP DYNAMICS EYES OPENED

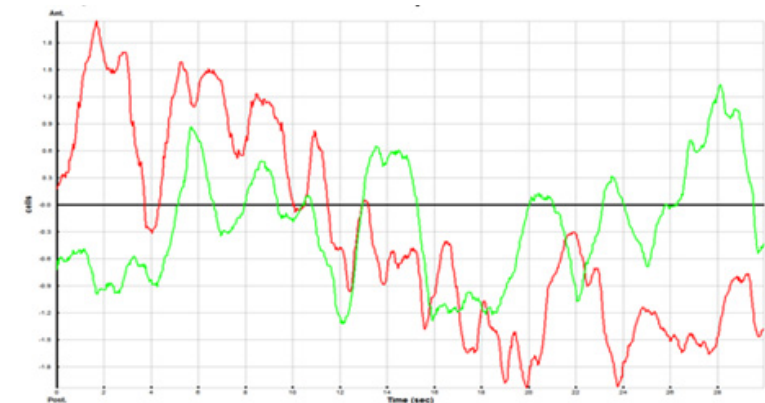


(A) EYES CLOSED (B)

(A) EYES OPENED (B)



A/P COP DYNAMICS EYES CLOSED

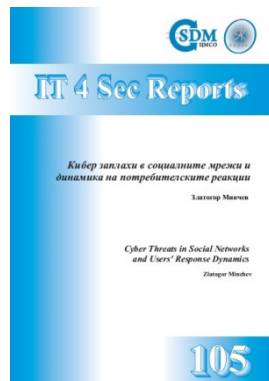


(A) - Before AV Stimulation
(B) - 10 min after AV Stimulation

(A) EYES CLOSED (B)

DISCUSSION & SELECTED PUBLICATIONS

THE OBTAINED RESULTS PROVIDE A SUSTAINABLE BASE FOR STUDYING AND ASSESSING MODERN DIGITAL SOCIETY AND NEW TECHNOLOGIES INFLUENCE ON USERS, ENCOMPASSING: AUGMENTED/SIMULATED ENVIRONMENTS, SMART DEVICES AND SOCIAL NETWORKS. BY THESE, A SIGNIFICANT SUPPORT IS GIVEN TO THE DIGITAL SOCIETY RESILIENCE BUILDING FOR NEW AND EMERGING HUMAN-MACHINE INTERACTION THREATS ANSWERING.



ACKNOWLEDGEMENTS

The study results are due to the successful realization of the following grants: EU Network of Excellence in Managing Threats & Vulnerabilities for the Future Internet – SysSec, www.syssec-project.eu; National Science Fund, Ministry of Education & Science: Cortical Regulation of the Quiet Stance during Sensory Conflict, TK 02/60, www.cleverstance.com; A Study on IT Threats and Users' Behaviour Dynamics in Online Social Networks, DMU 03/22, www.snfactor.com.

THANK YOU FOR THE ATTENTION!

