Brain Computer Interface

with visual neurofeedback using SSVEP (Steady State Visual Evoked Potentials) paradigm

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Brain Computer Interfaces

- Introduction
  - *Definition*
  - *Classification*
  - *Field of Application*
- SSVEP Complex
  - *Realization*
- Results
  - *SSVEP advantages*

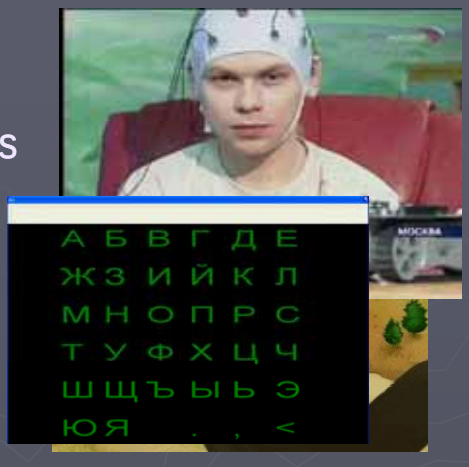
Introduction

- BCI (brain computer interface) is a system that use brain activity to control external devices such as computers, wheelchairs, or neuroprosthetic extensions

- Fields of application: rehabilitation, multimedia communication and relaxation (virtual reality)

The classification

- From imaginary limbs



- Identifying ERP (flash a character)

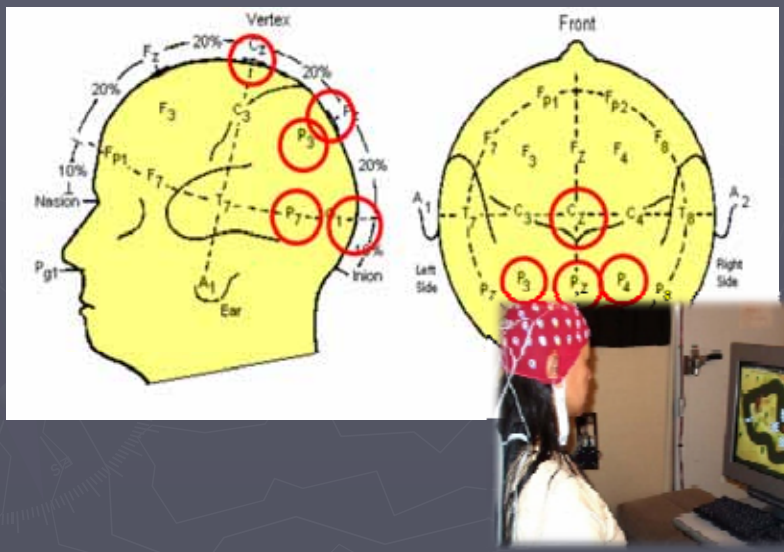
- Periodic waveforms, called SSVEP

4

SSVEP complex: realization

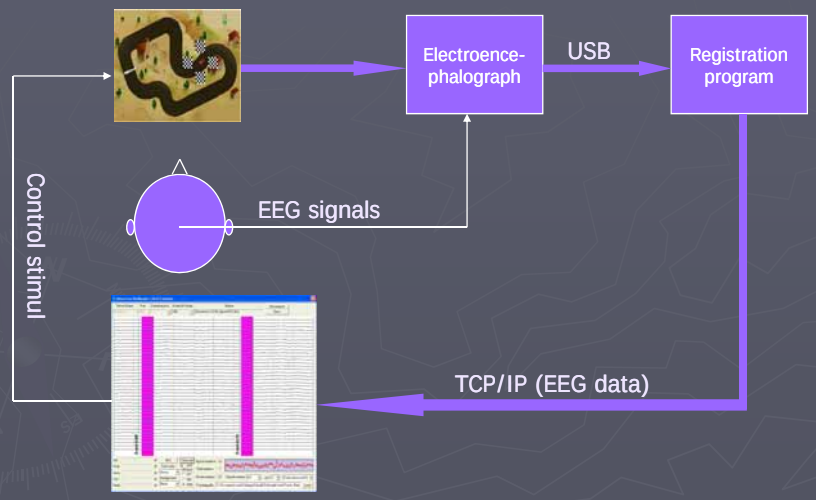
- The subject is able to control the direction of movement of the car by focusing his attention on a specific checkerboards

SSVEP complex: realization

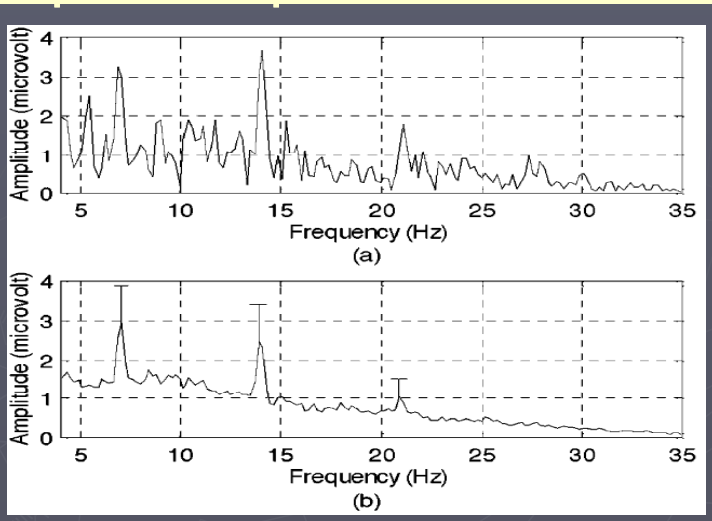


6

Block diagram of the SSVEP-based BCI system



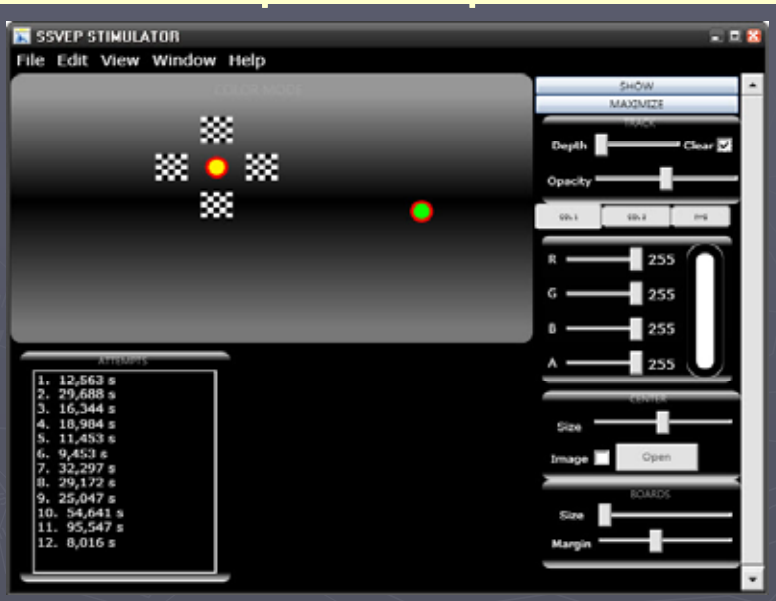
Amplitude spectrum of SSVEP



In response to 7 Hz stimulation: three peaks at 7 Hz, 14 Hz, and 21 Hz can be found clearly

8

SSVEP complex: implementation



9

SSVEP-BCI advantages

- It offers the possibility of high performance (information rate) with minimal training time and low requirements from the subject
- Relatively easy to extend to more commands
- The carefully designed SSVEP-BCI system can be relatively robust in respect to noise and artifacts

10

Thank you for your attention!!!