Doing by Thinking...

Proseminar: Introduction to the Functional Decoding of Brain Signals

Seminar: Invasive and Non-Invasive Methods to Decode Brain Signals in Realtime

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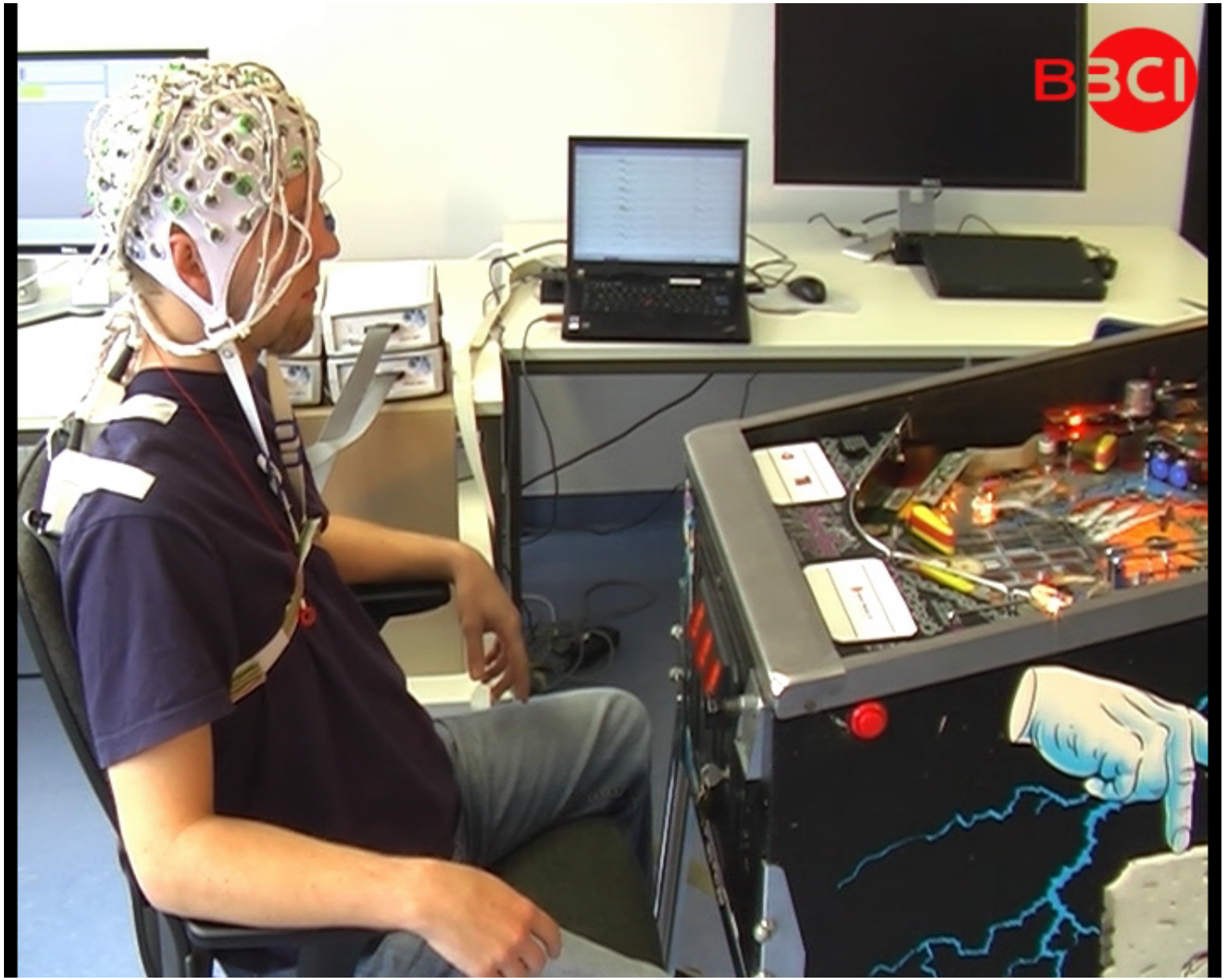
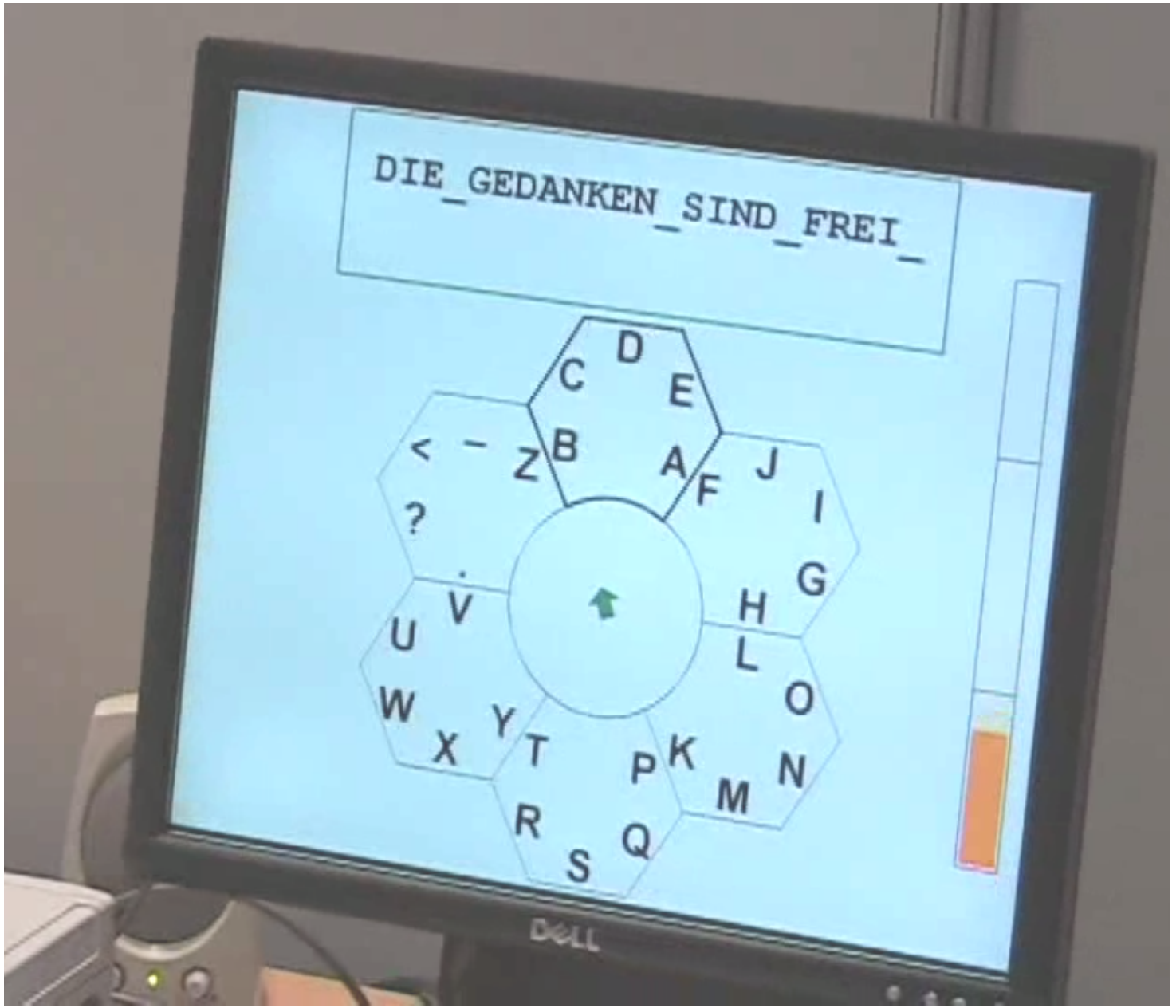
www.bsdlab.uni-freiburg.de/teaching/sose18

Application that uses decoded brain signals:



Spelling application:



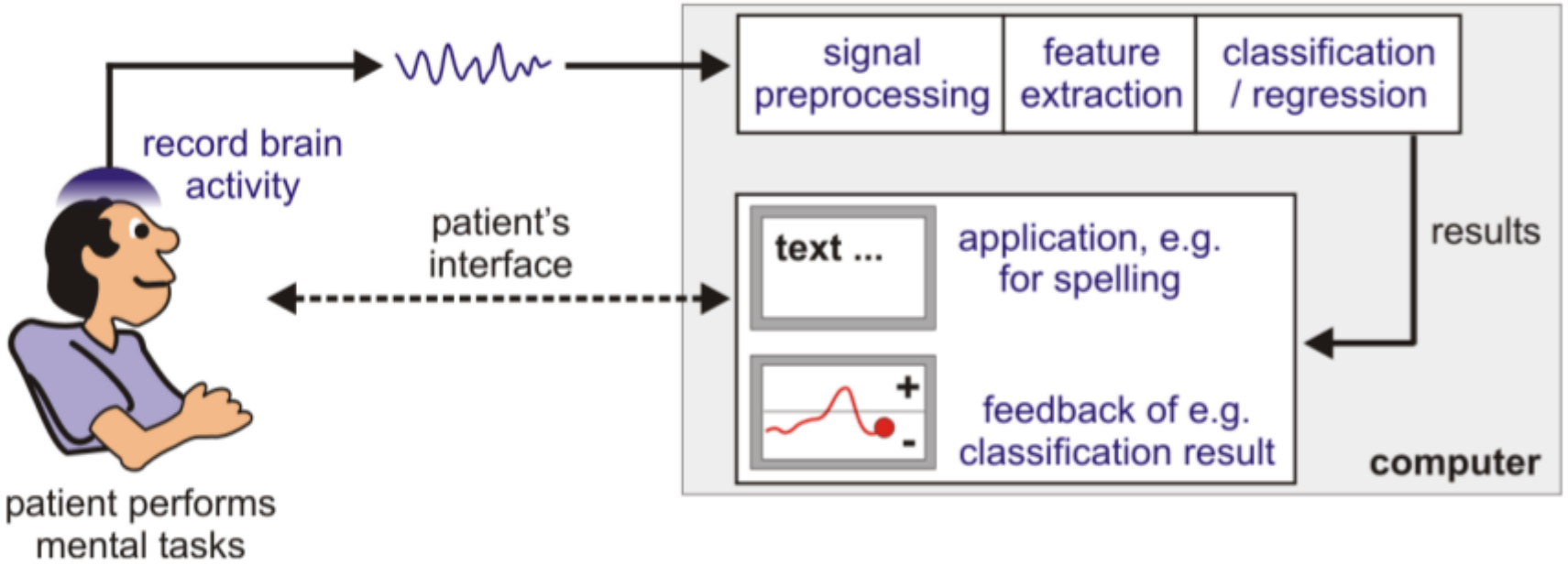
Play a chess game using visual attention:

Application that monitors mental workload:

Brain-Computer Interface (BCI)

- measures brain activity
- decodes brain activity with machine learning methods
- influences / drives an application using the decoded information

BCI Control Scheme

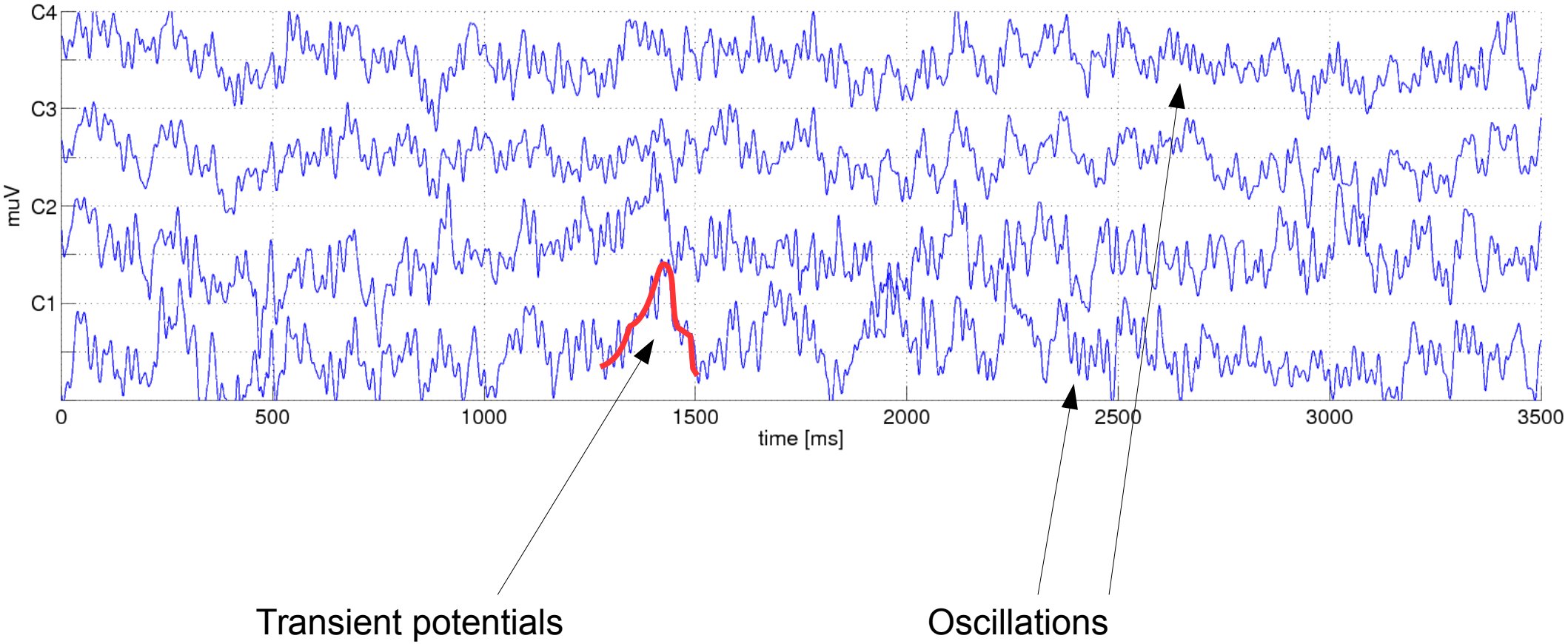


Types of tasks?

1. focus of attention to one of several *external stimuli* (visual, auditory, haptic, ...)
2. *self-initiated* mental imagery tasks (motor imagery, calculation, navigation...)


ANOS

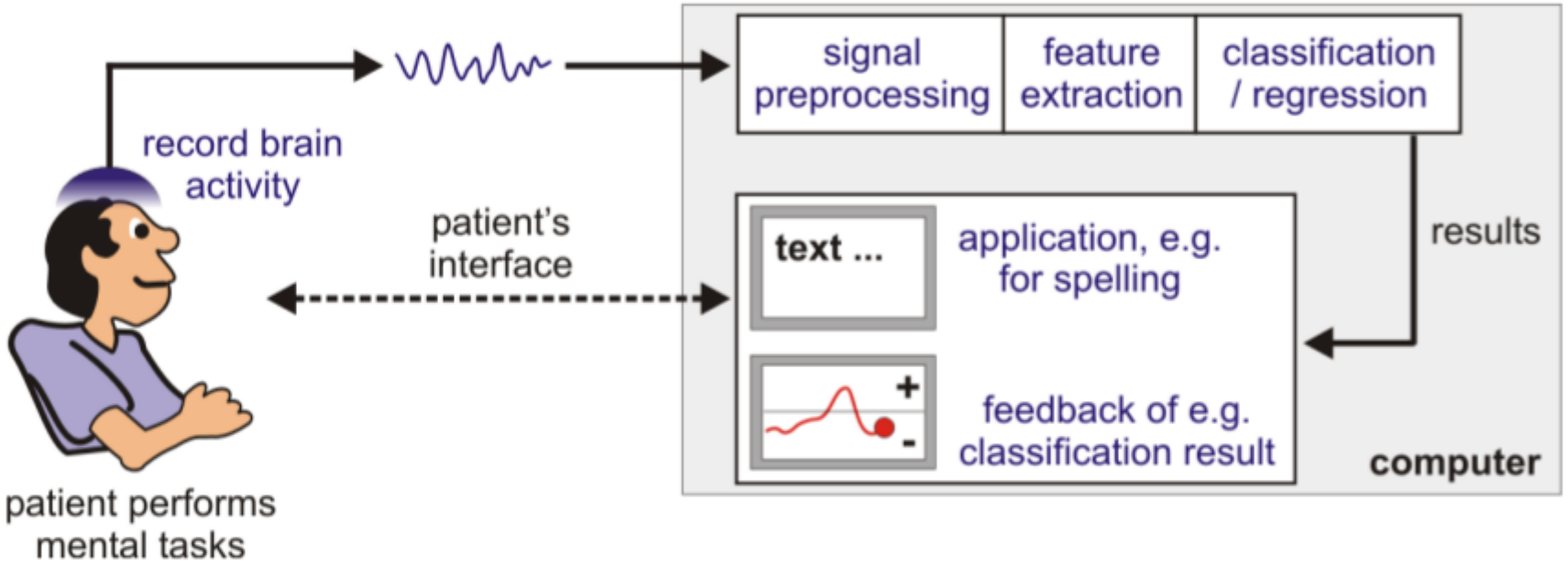
Examples of EEG recordings



Transient potentials

Oscillations

BCI Control Scheme



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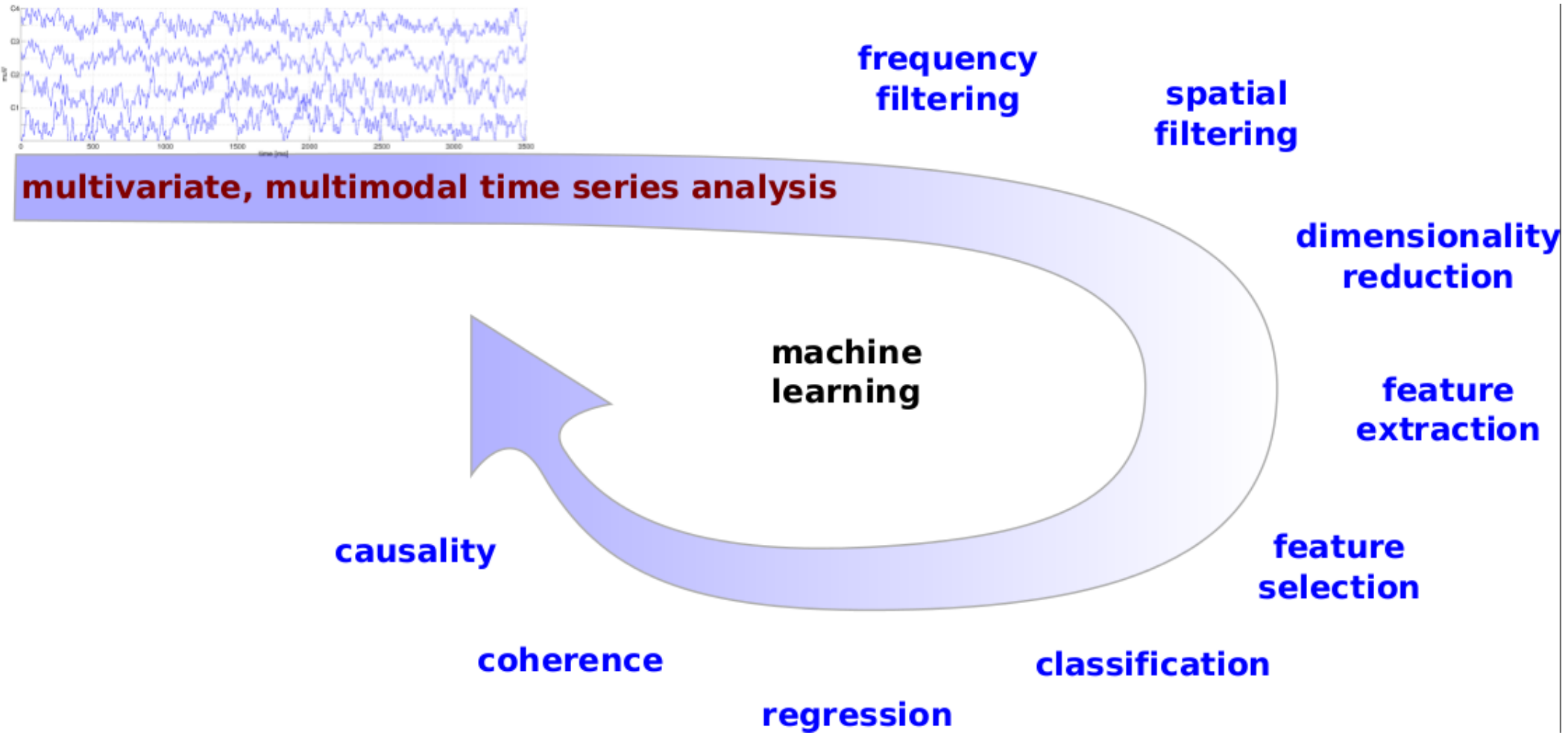
Role of machine learning in BCI?



Requirements

- Mai 17:
  Provide your supervisor with a 2-page resumé
  (commented table of contents)
- One presentation per topic: ~45 min (30+10+5)
- Active participation in discussions
- One seminar report per topic: 10 pages

Schedule (I)

- Matching student ↔ topics: today
- Meet your supervisor, pick up *initial* materials (end of week)
- “How to give a presentation” - by Prof. Burgard (date tbd)
- Hand in your resumé to your supervisor by May 17, 2017 (no continuation if this deadline is missed)
- Few individual meetings with your supervisor to get your presentation into good shape

Schedule (II)

- Every topic is presented during 1 or 2 full days (June/July)
  (we expect every student to attend both sessions)
- Your reports are due: 1 week after the last presentation session
  (we expect that you process & include feedback received after your presentation)
- You receive feedback on your report via your supervisor

Grading

- 60% presentation
- 30% written report
- 10% contribution in discussions
  (Giving and receiving feedback after presentation will be practiced)

Topics

→ Quick glance on topics

→ Distribution of topics

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