BCI Applications

In Games
This presentation is not about:

- Medical analysis
- Restoration of communication, movement (or in case of situational disability)
- Rehabilitation of movement
- Neurofeedback / Enhancement of mental abilities
- Biometrics, tagging, …
Why Use BCI?

Downsides
- EEG-cap hassle
- slow
- low accuracy
- lot of training

Upsides
- new info about the user
- additional modality
- novelty
Famous Examples

You've seen these last time
Figure 1: The mental typewriter 'Hex-o-Spell'. The two states classified by the BBCI system control the turning and growing of the gray arrow respectively (see also text). Letters can thus be chosen in a two step procedure.
Virtual Apartment

"BCI is not a mouse!"

-- Roderick Murray-Smith

(and not a keyboard either!)
Applications for healthy users

- Workload monitoring
- Hands-free control
- Private interaction
- "Oops"
- Affective computing
- Entertainment
- Neurofeedback / Enhancement of mental abilities
- Biometrics, tagging, ...

http://www.thegoalmine.com/bciapplications.htm and more...
Why Games so Interesting?

- Virtual Environment
  - Immersive
  - Safe
  - (potentially) Controlled
- Gaming:
  - Motivating
- Target the General Public
  - Large population
  - Gamers eager to adopt new technology
BCI in Games

- Synchronicity & Elicitation
- Direct Control & Modulation
- Feedback Loop: Flow
- Affective Computing
Synchronicity and Elicitation

MI, SCP  
Internally Induced

affect

P300, SSVEP
Externally Evoked

Self-Paced Interaction

Synchronous Interaction
Direct Control and Modulation
Feedback Loop: Flow

Considerations

- HCI
- Usability
- User Experience
Usability

- Ease of Learning
- Efficiency of use
- Effectiveness
- Memorability
- Error handling
- Satisfaction
User Experience

- Fun
- Engaging
- Meaningful
- Challenging, boring, frustrating, exciting, easy, etc!
Conclusions

- BCI != mouse, keyboard
- Combine HCI with BCI
- Many possibilities for healthy users
- The future will be fun! :}
The end