Personalisierung & Adaptivität für Serious Games

Grundlagen, Herausforderungen, Best Practices, Beispiele, Trends

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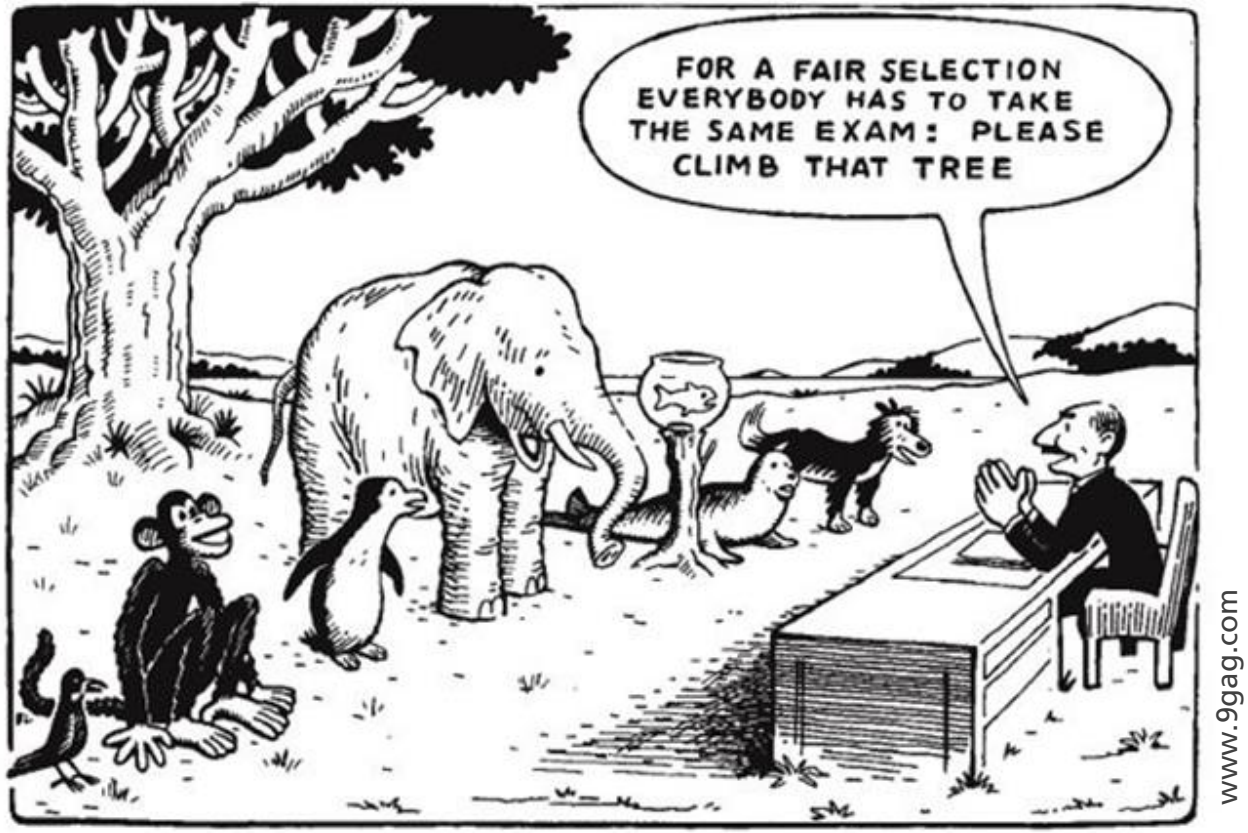
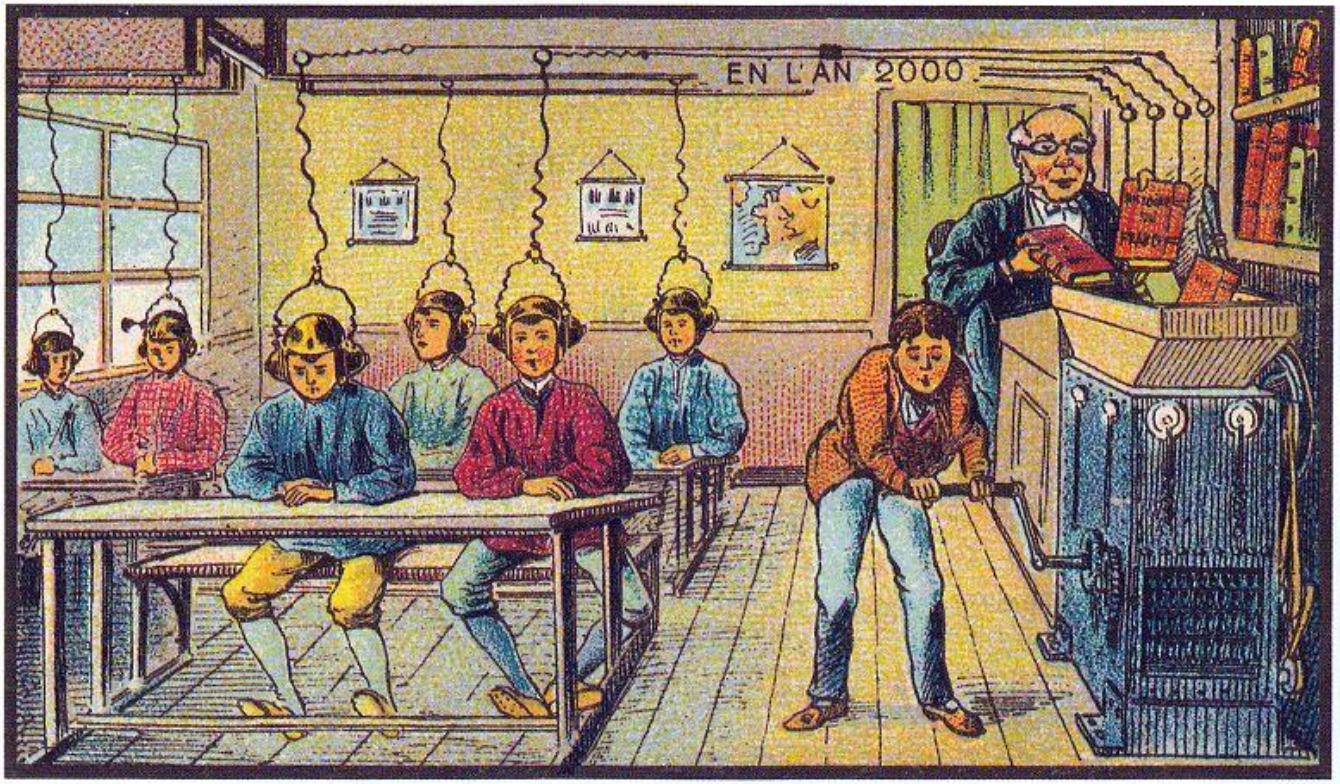
Stuttgart, 18. November 2015

Motivation



↑ Anpassung an Nutzer → ↑ Immersion → ↑ Lernen & Verstehen

Mechanized Learning



At School

Source: Wikimedia Commons

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Flow, Immersion
(Csíkszentmihályi)

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Vortrag Agenda

- Motivation
- Theorie – Personalisierung, Adaptivität
- Praxis – Beispiele
- Chancen, Herausforderungen
- Fazit

Theorie

ADAPTIVITÄT, PERSONALISIERUNG

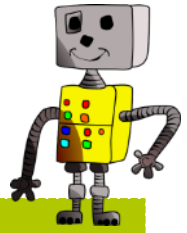
Personalisierung, Adaptierbarkeit, Adaptivität

Personalisierung

- Anpassung/ Einstellung
- Manuell/ Automatisch
- Bsp. Avatar-Aussehen

Adaptierbarkeit

- Anpassungs-möglichkeit
- Präferenzen, Modelle
- Offline/Online
- Manuell/ Automatisch

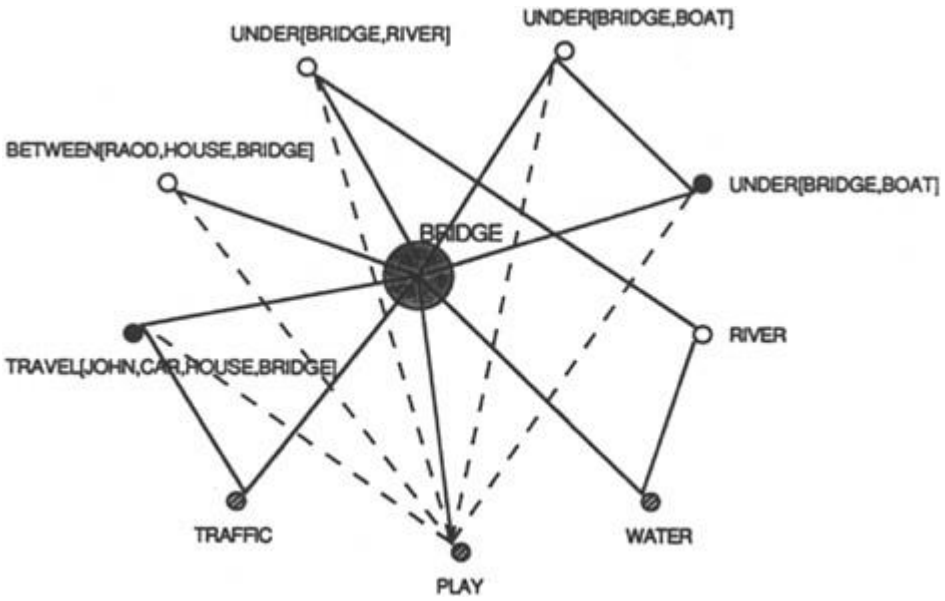


Adaptivität

- Automatische Anpassung an den Lerner
- Verhalten, Umgebung, Geräte, …
- Bsp. Schwierig-keit, Inhalte, etc.

Personalisierung Vorteile – Elaboration (Psychologie)

Personalisierte Inhalte bewirken signifikant höheres Engagement und eine tiefergehende kognitive Elaboration (vertiefte Informationsverarbeitung) [Petty1979, Teng2010]



W. Kintsch, "Discourse Processing," *Psychology: IUPsyS Global Resource*, 2009

sororitygirlplayswow.wordpress.com

W. Kintsch, "Discourse Processing," *Psychology: IUPsyS Global Resource*, 2009. [Online]. Available: http://e-book.lib.sjtu.edu.cn/iupsys/Proc/Bruss2/bpv2ch07.htm. [Accessed: 27-Jun-2014].
R. E. Petty and J. T. Cacioppo, "Issue involvement can increase or decrease persuasion by enhancing message-relevant cognitive responses.," *J. Pers. Soc. Psychol.*, vol. 37, no. 10, pp. 1915–1926, 1979.

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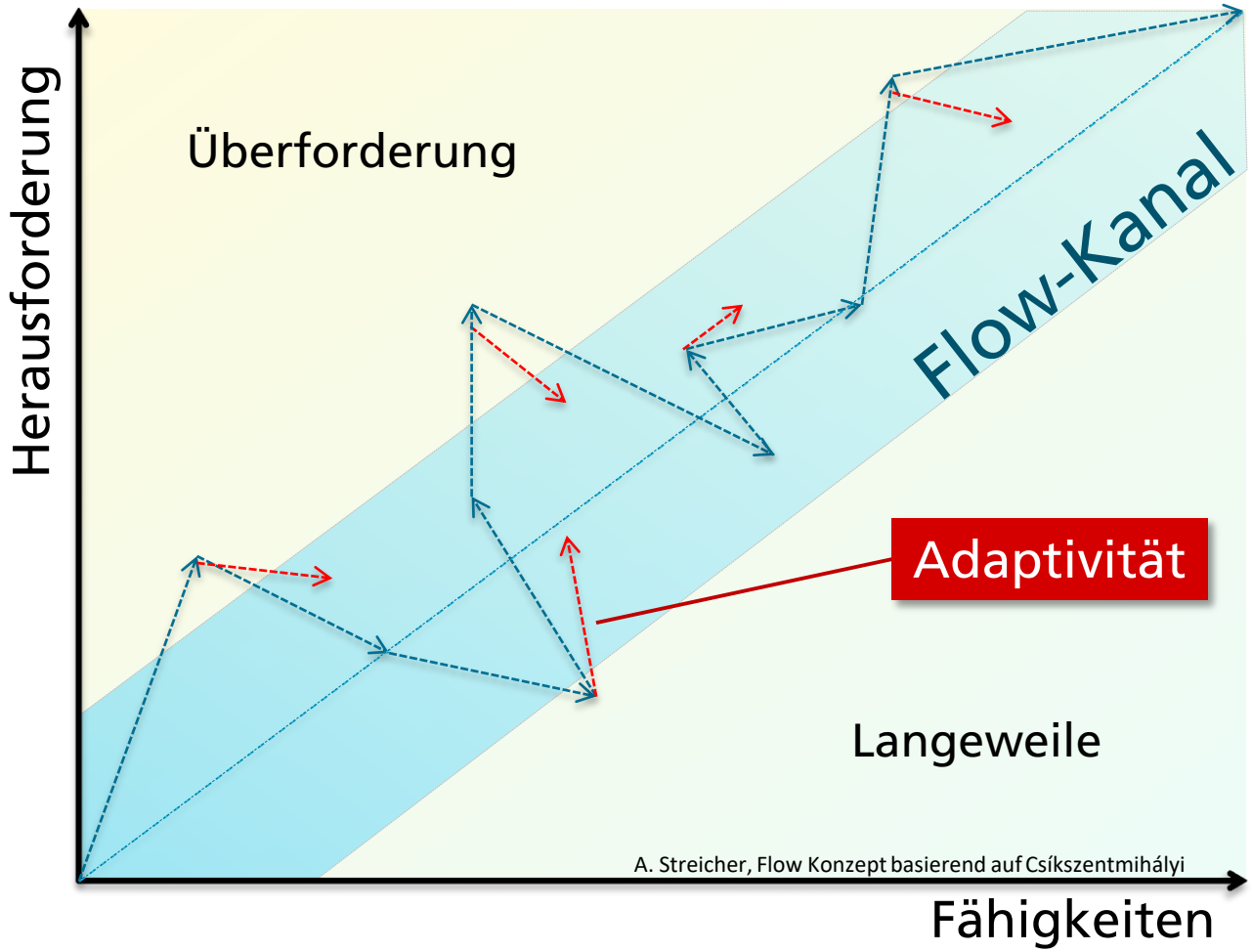
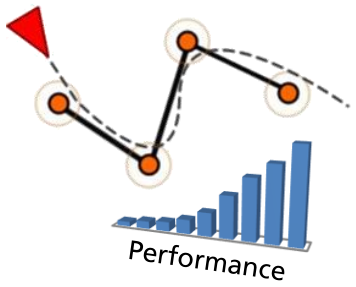
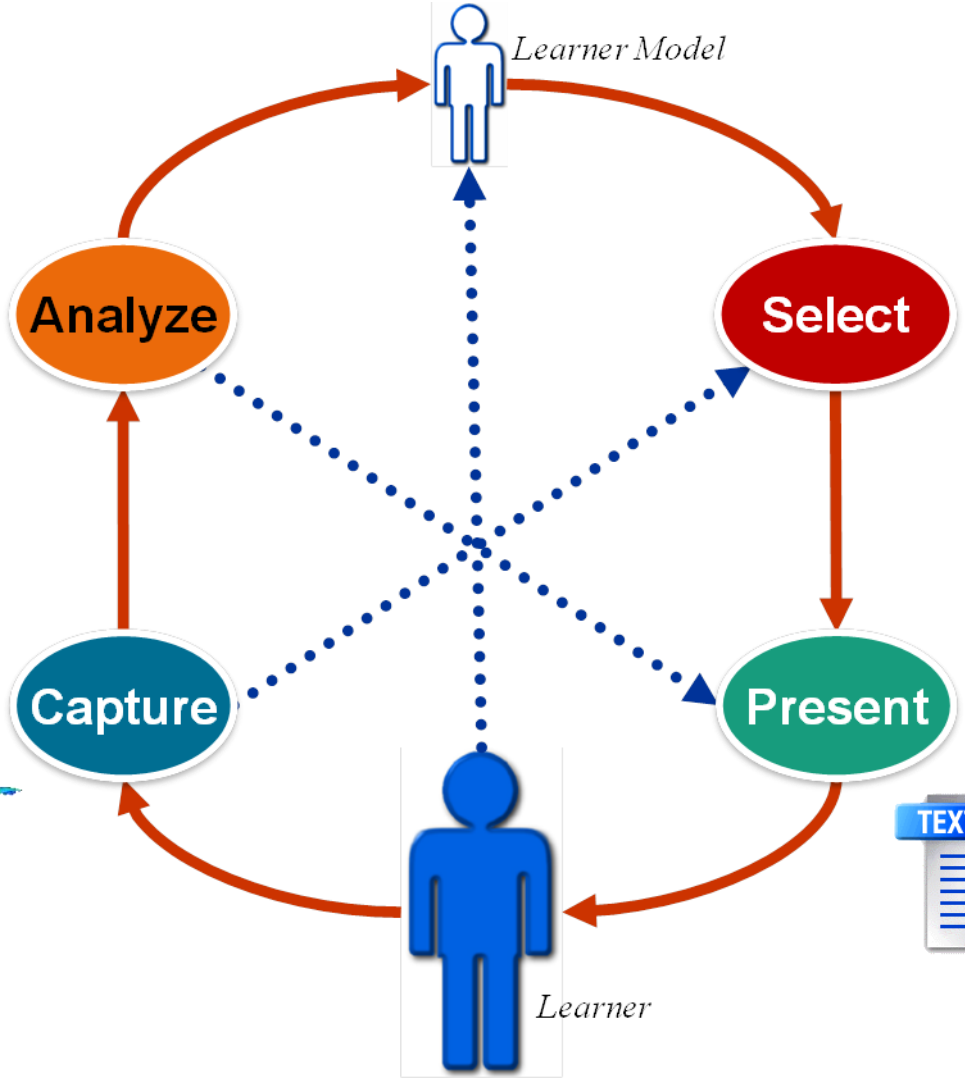
Adaptivität → Flow → Immersion
(Csíkszentmihályi)



Adaptionszyklus



$$\frac{\Delta \rightarrow B \quad \Delta \rightarrow C}{\Delta \rightarrow B \wedge C} \wedge R^{\dagger}$$

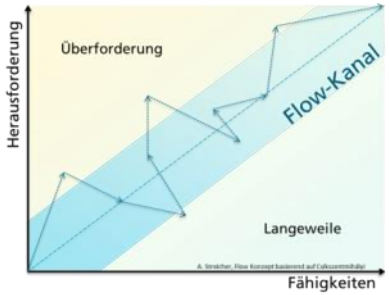


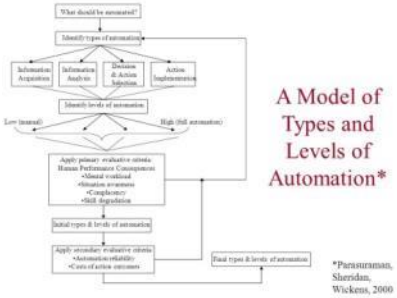
Four-Process Adaptive Cycle by V. Shute and D. Zapata-Rivera, "Adaptive educational systems," *Adapt. Technol. Train. …*, no. 1, pp. 1–35, 2012.

Modelle, K.I. Techniken

Reaktionsmodelle

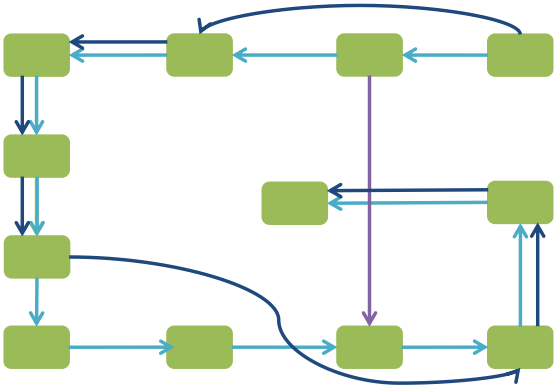
[Csíkszentmihályi 1990; Chen 2008; Murphy 2011; Sheridan 2005]





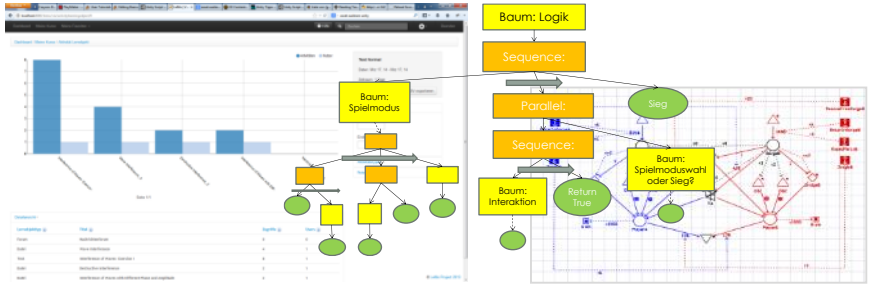
Adaptive Learning Paths

[Szentes 2011; Swertz 2013; Adams 2012]



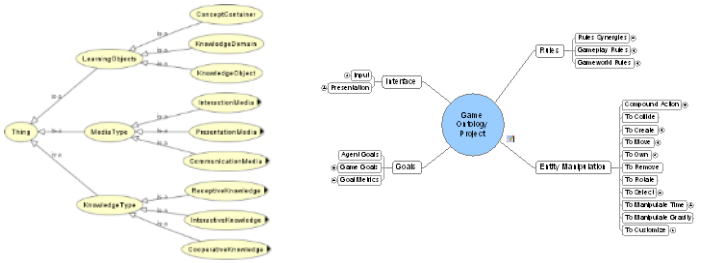
Learning Analytics, Behavior Trees, …

[Giotopoulos 2010; Biswas 2011; Champandard 2010; Drachsler 2008]



Domain & Cognitve Models, Game Ontologies

[Zagal 2008; Flórez-Puga 2008; Swertz 2013; Ghannem 2011]



Praxis

BEISPIELE

ELEKTRA EU-Project (ALIGN based)

[Peirce2008]

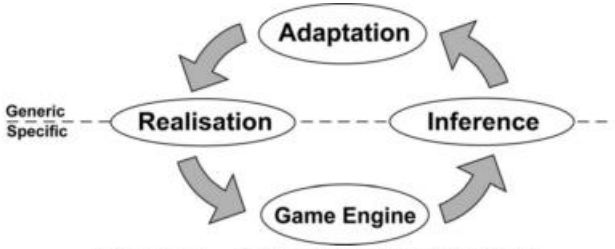


Figure 2 – Conceptual separation

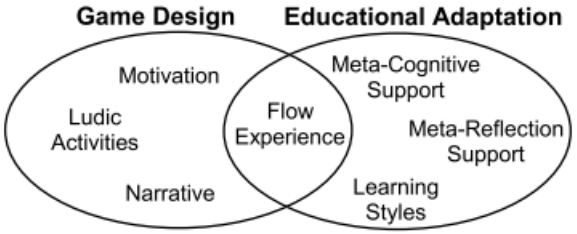


Figure 1 – Separation of concerns

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Language Trap Game (ALIGN based)

[Peirce2010]

Adaptive dialogue difficulty
Adaptive performance feedback
Adaptive motivational support
Adaptive meta-cognitive hints

Figure 6. An example of two personalised performance feedbacks from the companion character (left, centre), and an example of positive performance feedback delivered through visual emotions (right).

Figure 7. Examples of meta-cognitive hints for learners who are overly cautious(left), take excessive risks(centre), and are prudent and successful (right).

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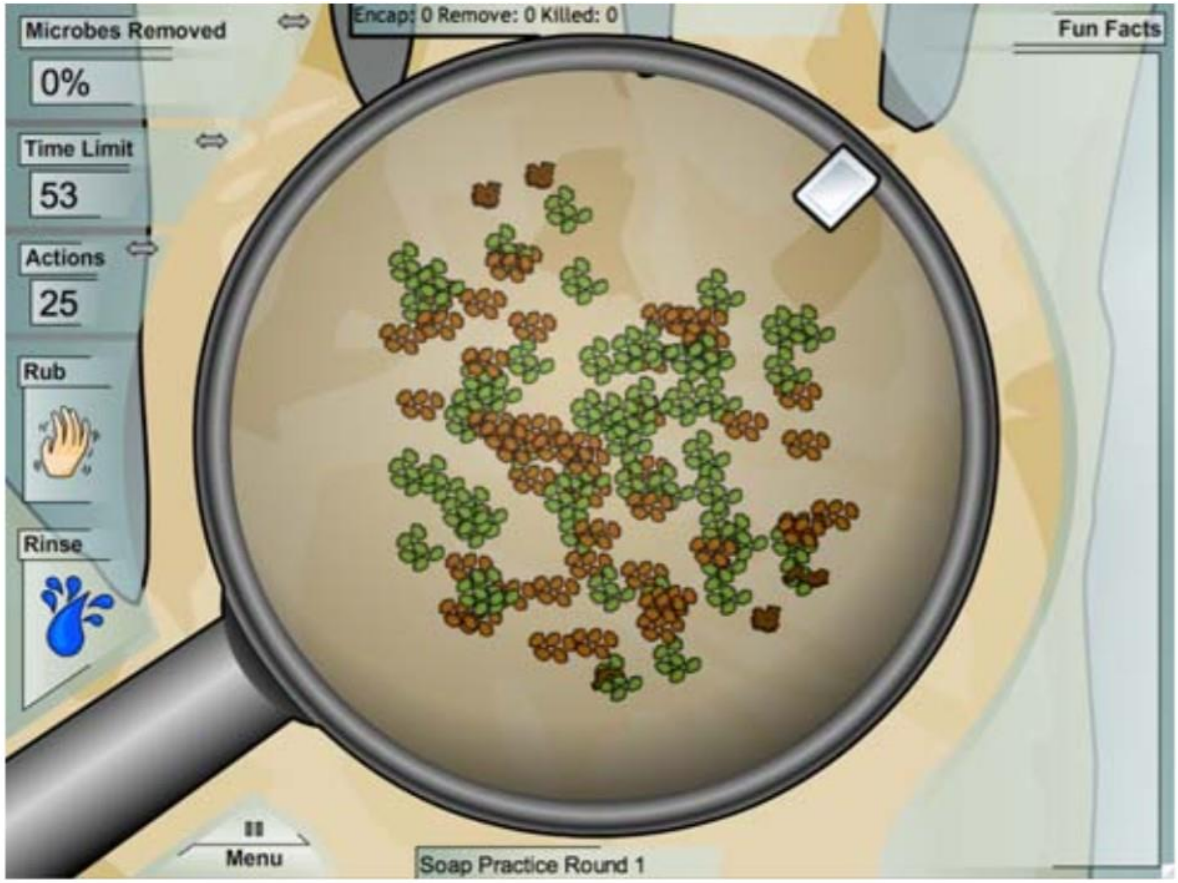
S.C.R.U.B. – dyn. Anpassung der Benutzungsoberfläche



[Magerko2008]

CHANCEN, HERAUSFORDERUNGEN

Serious Gaming – K.I. für Serious Games

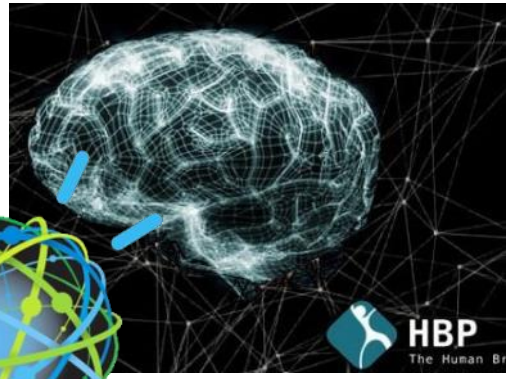
1992

FireFighter, 1992, Mindscape, www.gamesdbase.com

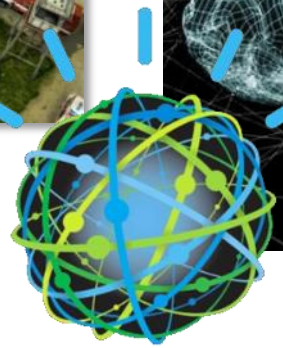
2014

Emergency 2014, www.deepsilver.com

Zukunft

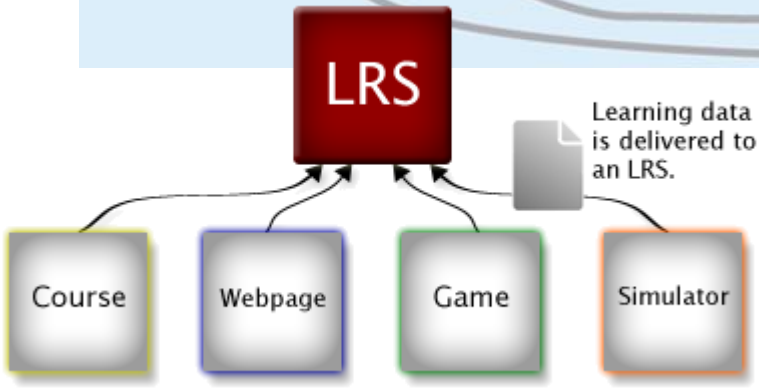


www.humanbrainproject.eu



Watson, www.ibm.com

Life-Long-Learning, E-Portfolio, xAPI



www.xapi-insi.de

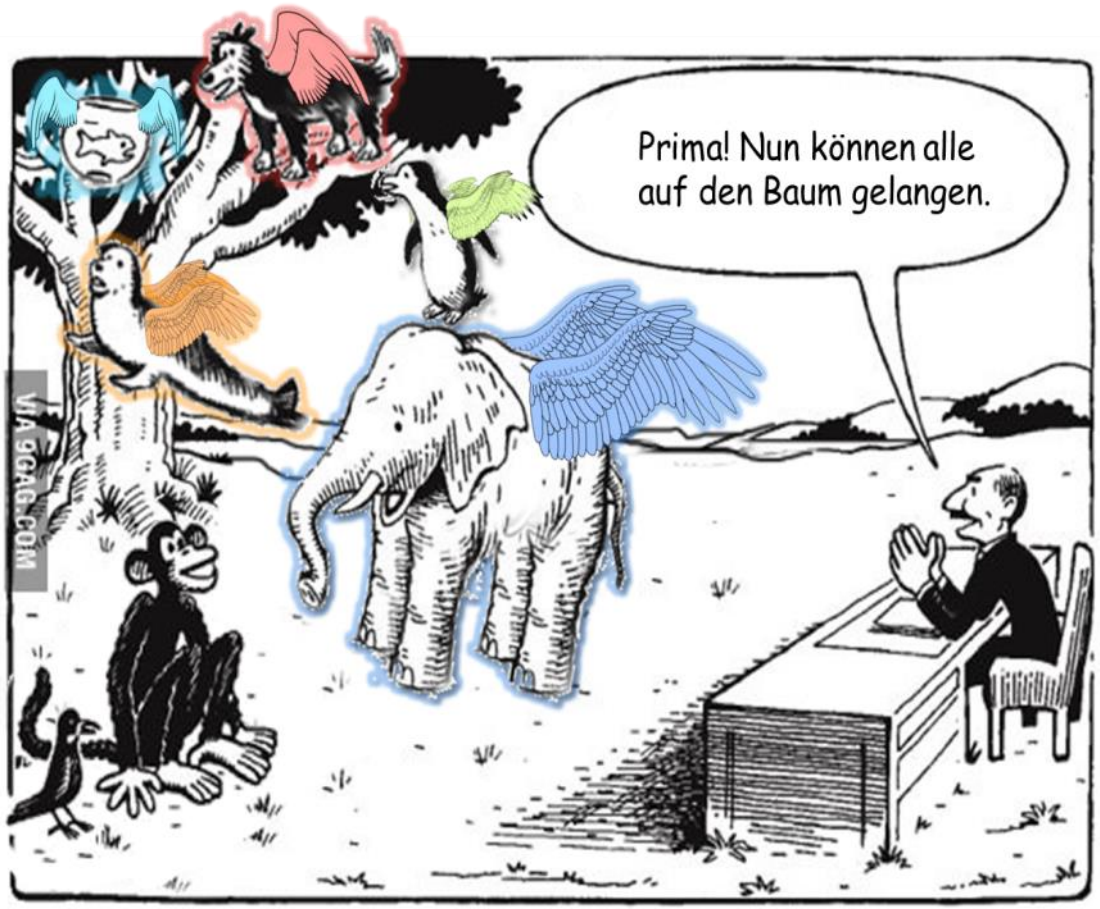
Interoperabilität für adaptive Serious Games & Simulationen

Zusammenfassung

- Steigerung des Lernerfolgs durch personalisierte Serious Games (SG)
- Immersion & Flow als Motivationsmodelle
- Adaptive Komponenten („K.I.“) adaptieren SG basierend auf Lernerverhalten bzw. Benutztermodellen
- Adaptive Serious Games sind aktiver Forschungsgegenstand

Ausblick:

- Interoperable Adaptivität
- Life-Long-Learning (LLL) Unterstützung, z.B. durch Dateninterop. (xAPI)



Vielen Dank für Ihre Aufmerksamkeit!

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