Game research for training and entertainment

Learning

Learning from Serious Games?

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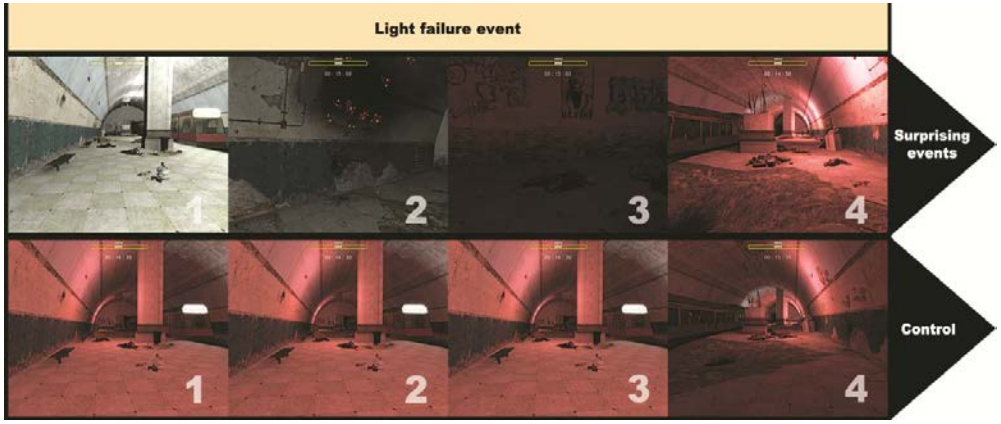
Research questions

1. How do we learn (optimal) from Serious Games?

2. What do we actually learn from Serious Games?

Design Rules

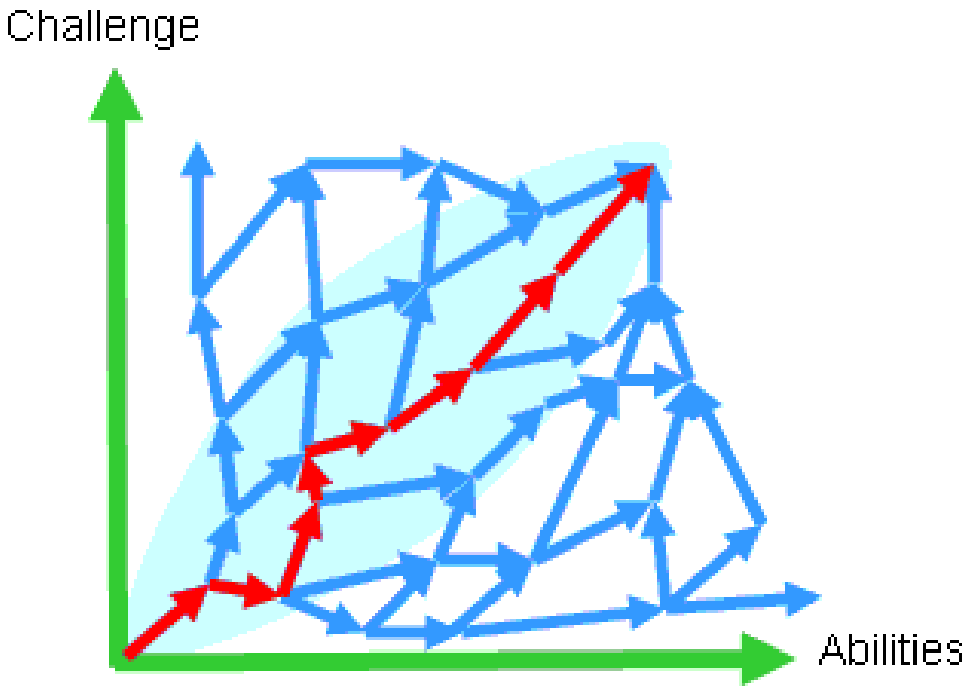
1. Adaptivity
2. Cueing
3. Regulation of information complexity
4. Narrative elements (e.g. surprise)



Dynamic Difficulty Adjustment

Online adaptation:

Continuously balance challenges in the game with (developing) skills of the trainee



Agent based approach

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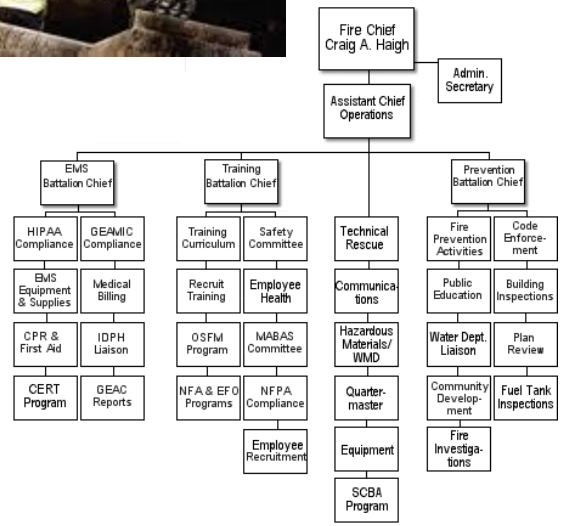
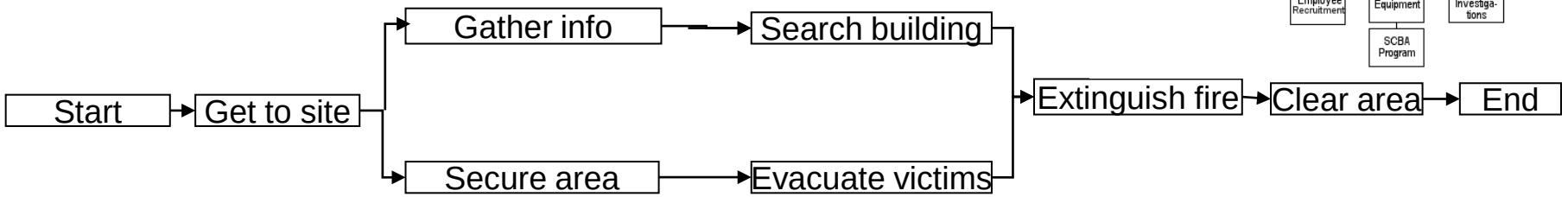
- **Complex individual behavior and adaptation possible**

Agent organisation for coordination

- **Balance between individual flexibility and global story line maintaining learning goals**





Structures for learning

1. Surprise
2. Foreshadowing
3. Perspective
4. Storyline
5. Game mechanics
6. Audiovisual context
7. Rhetorics
8. …

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Learn or persuade

1. Rules
2. History
3. Audiovisual context
4. Visual content
5. Texts

Transfer of Gaming

To what extent skills, learned by training (playing a game) are transferred to the real task?

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PC gaming transfer taxonomy **(outline)**

Attitudes	
Motivation	++
• Initiative	+++
• Integrity	+
Social skills	
Communication	+++
• Cooperation	+++
• Leadership	+++
Cognitive skills	
• Interpretation	+
• Problem solving, decision making	+++
• Planning	+++
Knowledge	
• Background, context, boundary conditions, specific facts	++
• Workig with rules and procedures (if…, then…)	+++
• Functionality (how it works, controls, interfaces)	++
Perceptual-motor skills	
• Searching, detection, perception (different modalities)	-
• Operation (controls, instruments, displays)	+/ -
• Motor performance	- - -

Main results

1. Visual cues are effective with game experience

2. Adaptivity saves learning time up to **30%!**

3. Narrative elements improve learning (by surprising events) and curiosity (by foreshadowing)