



3^e SERIOUS GAMES SESSIONS EUROPE

Game Based Training Simulators

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SEVENATUS
INTERACTIVE TRAINING SOLUTIONS



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Presentation outline



InGaMe Lab, University of Skövde



Some notes on our view of serious games



Our specialisation, two approaches



o The driving simulator



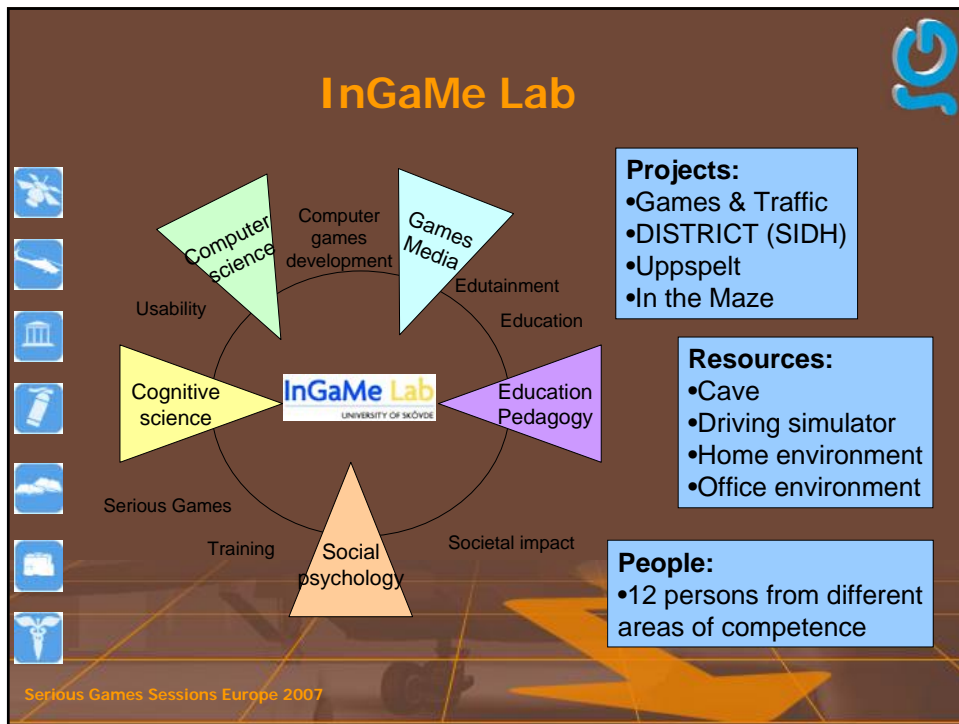
o The firefighter simulator




Some generalised experiences




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Serious games: our definition



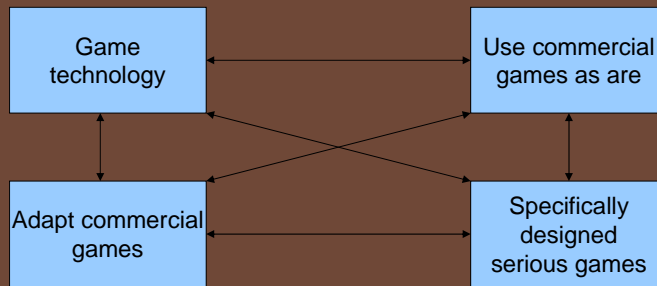


Serious games are games that engage the user, and contribute to the achievement of a defined purpose other than pure entertainment (whether or not the user is consciously aware of it).

A game's purpose may be formulated by the user her/himself or by the game's designer, which means that also a commercial off-the-shelf (COTS) game, used for non-entertainment purposes, may be considered a serious game

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Serious games: overview



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Serious games: sectors and objectives

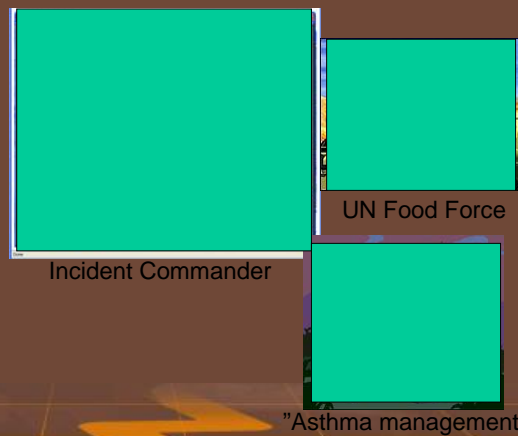


□ Sample sectors

- Military
- Government
- Healthcare
- Industry

□ Sample objectives:

- Education
- Training
- Rehabilitation
- Information
- Policy making
- Marketing
- Recruitment



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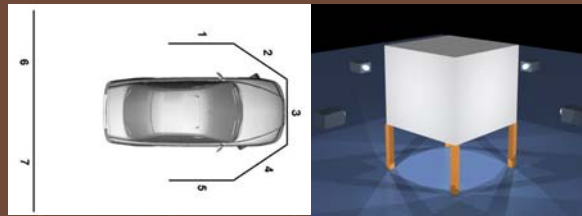
Our specialisation



□ Game based training simulators



□ Generic multi screen display architecture



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Two approaches



Expert input
Open source

Driving simulator

Expert collaboration
Half Life 2

Fire fighter simulator

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A simulator based on video game technology



- ❑ Installed at the University of Skövde 2006



- ❑ A complete Volvo S80



- ❑ Off-the-shelf graphics



- ❑ Scalable and flexible



- Number of screens
- Type of software
- Open source



- ❑ Used in the Games & Traffic project



- Traffic school survey
- Experiments



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Experiments - setup



- ❑ Driving game (the lane change test)



- 5 lane motorway, varying traffic and fellow road user behaviour



- Two versions:
game (Ambulance following, grades)
non-game (free driving)



- ❑ 70 subjects (24 driving school students, 46 university students)



- ❑ Reference test 1 – Driving session – Reference test 2



- ❑ Data collection



- Observations through logging and video recording
- Questionnaire

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Experiment: traffic variables



Short headway distance:
seconds/km within 0-3 seconds
behind a vehicle



Speed violation: seconds/km
driving 10 or more km/h
above the speed limit

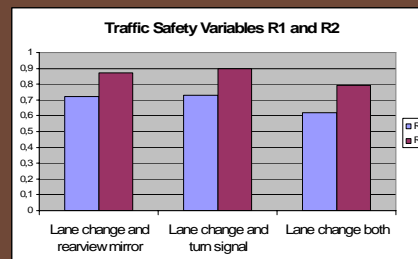
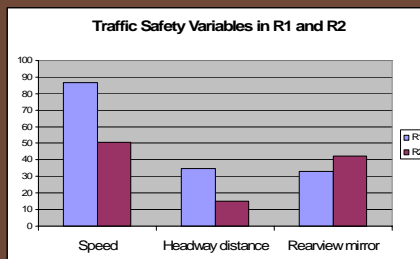


Lane change + rearview mirror:
the proportion of lane changes
preceded by a rearview mirror look

Lane change + mirror + signal:
the proportion of lane changes
preceded by a rearview mirror look and
turn signal – i.e. a correct lane change.

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Results: no grouping



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Experiences from the driving simulator



Technology



- o A game based driving simulator is useful for this type of simulation task



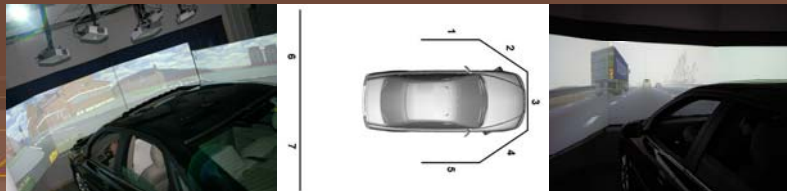
Learning

- o Measurable effects for all traffic variables between R1 and R2



Game component

- o The results indicate that the game task can be used to reinforce some learning aspects



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SIDH – a Game based firefighter training simulation



Developed by University of Skövde and Swedish Rescue Services Agency in cooperation



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The SIDH Game



- Complement to traditional methods
- Flexible training
 - o Different environments
 - o Individual and voluntary training
- Learning objective: to scan a building and search for people
- Additional aspects:
 - o Use of real equipments
 - o novel interaction mode
 - o physical pressure
- Emphasis on entertainment aspects
 - o Combine learning goals with entertainment



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Demonstration



- 2D map showing search behaviour
- Player inside a cave (4 screens) interact with the game
 - o Player is rotating
- A single-computer view of the game
 - o The virtual world is rotating



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Game Rules

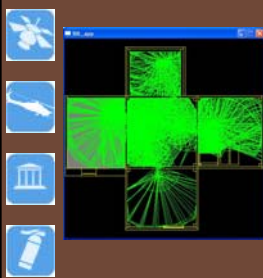


- In each level the player should search a building for victims
- A level fails if:
 - o A victim is missed
 - o A room is not visited
 - o The maximum time is used
 - o The player dies
- A score is computed based on:
 - o Percentage of the area searched
 - o Remaining time
 - o Number of attempts



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Experiment: expert evaluation



?



Training in simulator followed by an evaluation of a live exercise. Possible to learn efficient Search strategies?



- Selfreported learning:
 - o 77% of subjects reported to have learnt something.
 - o Systemacy
 - o Self confidence
 - o Calm action
- Expert evaluation of subjects:
 - o SIDH players were judged to be more efficient and systematic in their searches
 - o SIDH players did not lose orientation as often as the control group

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Experiences from the SIDH game



□ Technical:



- The modification of a commercial game for a cave environment with novel interaction model was possible



- Coarse body movement interaction is possible



□ Game component:



- Games and game modifications can be used to train firefighters



- SIDH is a successful serious game project



- Collaboration between firefighter instructors, researchers and game developers

- Iterative development

- Balancing between pedagogical content and entertainment

- Enjoyment, learning and exhaustion

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Generalised experiences from the development process



□ Iterative



□ Joint application development (JAD)



- Communication with commissioners



- Negotiation of goals



- Demonstrate possibilities



- Evaluate



□ Prototype/ Rapid application development (RAD)

Analyse
commissioners'
needs

Develop
relevant
content

Evaluate

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Generalised experiences for game based training



Identify learning goals



Games integrated in the training process

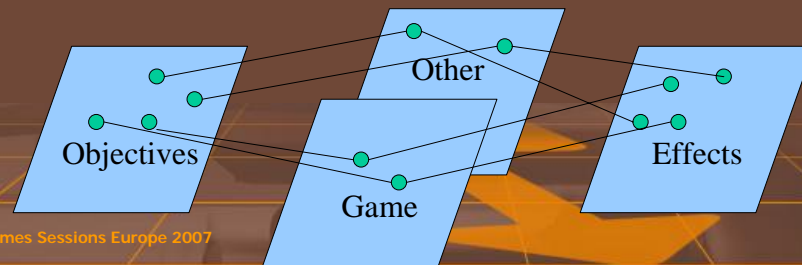


Debriefing



○ "automated expert evaluation"

○ Soft and hard variables



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