

SIDH – a Game Based Firefighter Training Simulation



SIDH - Overview

- A serious game
 - Developed in collaboration with Swedish Rescue Services Agency (SRSA)
 - Firefighter training – BA entry
 - Half-Life 2 mod
 - Cave-based
 - Novel interaction model
- Experiments
 - Firefighter students
 - Game sessions
 - Traditional BA entry exercise



Traditional BA Entry Training

- SRSA is responsible for the training of fire and rescue operatives
- Students practice search methods in different physical buildings
 - Fire and smoke may be generated
 - When no smoke is present a translucent visor is used
- Instructors are present
- A great number and types of buildings are required



The SIDH Game

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

Demonstration

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



Game Details

- 16 levels
 - 1 tutorial
 - 2 bonus levels
 - 13 "proper" levels – objective is to search a building to find and evacuate victims
- Radio communication through air mask
- Accelerometer sensors attached to boots
- Player orientation and vertical height detected from the Fogfighter nozzle



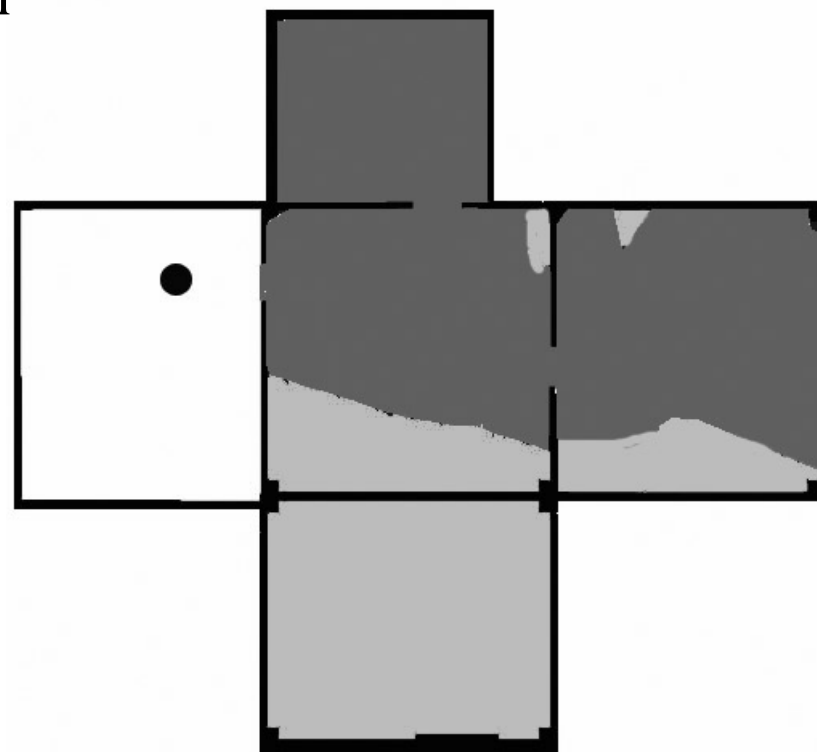
Crouching in Smoke

- When a player is crouching in smoke-filled areas
 - the sight is better
 - there is a lower "health penalty"



Game Rules

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



Experiments

- 31 participants. All first year students at the SRSA
- Two groups: A (15 persons) and B (16 persons)
 - Group A played the game 2×30 minutes followed by a traditional BA entry exercise
 - Group B performed a traditional BA entry exercise followed by game session (30 minutes)
- Learning effects and player response was studied through questionnaires, video recordings and game logs

Results – Player Response

- They understood what they should do and managed to do it
- The players were engaged in the game
 - They enjoyed the game
 - They were exhausted
 - They wanted to play again
- They improved their search performance in the game
- Experience from real search missions seem to improve game performance
 - The two players with the highest game score had most real firefighter experience

Results – Learning Effects

- 77% state that they have learned things from the game:
 - “I must be 100% convinced that there is no one left in the room when I have searched it”
 - “To search everywhere – even in closets”
 - “To be careful and to search everywhere”
 - “To be calm and to have trust in myself and not *wander around* too much”
 - “I’ve got an understanding of how to search an apartment. I’ve also realized that it is tiresome”
 - “To search systematically and make sure all areas are covered”
 - ...

Preliminary Results – Evaluating the BA entry exercise

- Experienced SRSA teachers have evaluated the search performance
- Preliminary results show that:
 - Search quality depends heavily on sight conditions
 - SIDH users are more efficient and systematic
 - SIDH users lost orientation less often



Conclusions

- Games and game modifications can be used to train firefighters
- The modification of a commercial game for a cave environment with novel interaction model was possible
- Coarse body movement interaction is possible
- SIDH is a successful serious game project
 - Collaboration between firefighter instructors, researchers and game developers
 - Iterative development
 - Balancing between pedagogical content and entertainment
- Players get exhausted, learn and enjoy playing the game!