AUGGGMED facts and figures

- AUGGGMED stands for “Automated Serious Game Scenario Generator for Mixed Reality Training”
- Funded by the EC’s H2020 Secure Societies theme
- 36 month project: 1\textsuperscript{st} June 2015 – 31\textsuperscript{st} May 2018
- 14 partners from 6 different countries
- €5.5M budget
Background

Current Threats

- Criminals and terrorists target **vulnerable infrastructure and victims** for maximum impact.
- They are constantly devising **new strategies** that are **difficult to predict, prepare and defend against**.
Current Training

- Desk based exercises
- Live training exercises
- Limited Virtual Reality (VR) based training
Limitations

Limitations with the desk based training methods include:
• Lack of realism
• Limited individual feedback

Limitations with the current live training methods include:
• Difficult and expensive to set up and run
• There are limited scenarios which can be covered with time, resources and venues available
• It is difficult to maintain uniform levels of skill across teams and individuals

Limitations with the current VR training methods include:
• Agents’ behaviour and events (e.g. explosions) are manually controlled by the trainers - lack of evidence-base
• Mainly designed for a single trainee usage or single agency
The aim of AUGGMED is to develop a serious game platform for the training of first responders. The game scenarios will be delivered through virtual reality (VR) and augmented reality (AR) environments. The system enables single- and team-based training of end-users with different levels of expertise from different organisations responding to terrorist, organised crime threats and other crisis needing a multi-agency response. Learning outcomes include the acquisition of emotional management, analytical thinking, problem solving and decision making skills. Crowd behaviour and simulation of fire/explosions are based on the best available models.
Training Benefits with VR and AR

- Cost effective
- Immersive
- Allows to play out scenarios that would be too dangerous or complex to train in any other way
- Access to “real” infrastructure sites
- Can help to improve the acquisition of emotional management, analytical thinking, problem solving and decision making skills.
Modes

Basic Mode (Conventional PC game)
- Training anywhere using PC and/or portable devices with limited interactivity (e.g., no mobility or tactile feedback).
- Trainees can interact with virtual and real agents (with avatar) who join the training session remotely.

Intermediate Mode (Immersive VR)
- Training anywhere using immersive VR (e.g., HMD with limited mobility and tactile feedback).
- Trainees interact with virtual agents and avatars of real agents who join the session remotely.

Full Mode (Immersive AR On-Site)
- Training On-Site using immersive MR (full mobility and advanced tactile feedback).
- Trainees can interact with simulated avatars as well as avatars controlled by other trainees who join the training session remotely.
Pilot 1

Physical gun attack and fire at a generic UK airport [May 2016]
Trainees: Police (regular and firearms)
- Airport having lighting malfunctions
- Three people enter, concealed weapons and incendiary device
- Blend in then start shooting and start a fire
- Blue team to locate, attempt to subdue/arrest or eliminate

Feedback positive, fed into further development of system and functionality
Suspicious bag, IED bomb attack and medical triage at an underground metro station (Muntaner) in Barcelona [March 2017]
Trainees: Railway operators and paramedics
• Suspicious left luggage, evacuation of station – 3 Railway Operators
• Triage of casualties post explosion of IED – 5 paramedics
• Additional demo of prototype haptic vest

Excellent immersion; additional functionality and voice commands to be added
Pilot 3

Physical and Cyber-attack at a passenger port terminal in Piraeus [February 2018]
Trainees: Port Police and Port Security staff

- Augmented Reality representation of the cruise ship terminal
- Attack from outside the port terminal
- Knives, guns and grenades
- Attack civilians and detonate an IED hidden in a rucksack
- Car bomb
Let’s see it in action...
This is all totally wonderful – but do trainees actually benefit from playing?
Longitudinal Treatment Comparison without Control Group

- Take a large number of trainees of a similar experience and training level
- Split them randomly into four groups
- All groups get a classroom-based introduction
- After this, the groups receive different consolidation sessions:
  - Group A does two live exercises
  - Group B does two VR-based exercises
  - Group C and D do one each, in opposite order
Evaluation

Knowledge
Knowledge check can be a simple paper and pencil exercise, e.g., can trainees replicate the correct steps on paper, the reasons why these steps are necessary, etc.

Behaviour
Behavior tests: observations of what the trainees do, including time to make a decision, mistakes, insecurities, speed of work, conscientiousness.

Subjective measures
In addition, it would also be possible to ask for subjective measures such as confidence in their decisions/execution of the task.

Repeat the knowledge check two months later and compare the results with the first test to see how much learning ‘sticks’.
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<th>AUGGGMED Team</th>
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<td><strong>Law Enforcement, First Responders</strong></td>
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<td>• West Yorkshire Police</td>
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<td>• Ministry of Citizens Protection, Greece</td>
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<td>• Barcelona Medical Agency -SEM</td>
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