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We'll take it from here: letting the users take charge of the evaluation and why that turned out well

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Abstract
The operational challenges faced by law enforcement and public safety personnel are constantly evolving, while the training and certification process has stayed the same. New technologies such as virtual reality, mixed reality, or game-based simulators are being researched as promising enhancements to traditional training methods. However, their widespread adoption, particularly by smaller units, faces barriers such as cost – due in no small part to the difficulties of developing and especially evaluating such large-scale interactive systems. In this case study, we present MINT – a low-cost mixed-reality Multimodal INteractive Training system, aimed at supporting the training of small- and medium-sized law enforcement and infantry units. We discuss the challenges and approaches taken in the participatory design of the training system, its agile-based development and implementation, and its qualitative evaluation with users and subject-matter experts.

Keywords
User studies; evaluation methodology; mixed-reality interaction; immersive gaming.

Figure 1: Evaluating the MINT system with subject-matter experts.

ACM Classification Keywords
H.5.2 [User interfaces]: Evaluation/methodology; K.3.1 [Computer Uses in Education]: Computer-assisted instruction.

General Terms
Experimentation; Human Factors.

Summary
The growing training and operational needs of law enforcement and public safety personnel can no longer be met efficiently and effectively through existing infrastructure and resources. While the demands of day-to-day operations are constantly changing, the training of law enforcement personnel and the certification process has largely stayed the same. While several technological solutions exist for enhancing training, widespread adoption of current approaches and solutions, such as virtual training, is hindered by significant cost barriers and by lack of scalability and reach. This creates challenges for smaller geographically disconnected units, which characterizes most rural police departments in North America. To address this challenges, we have developed MINT, a technological solution for a game-based, immersive, mixed-reality multimodal Course of Fire and Application of Judgement training, which allows its users to easily modify training scenarios, interact with game avatars through voice commands, and operate laser weapons and various other electronic artefacts. A complete description of the system's implementation can be found in [1], while details of its features to support law enforcement training are presented in [2].

In this case study we report on the evaluation of MINT with our target users – infantry soldiers and police officers (illustrated in Figure 1). We describe our agile development, combined with a design-evaluation cycle that closely engaged users (a hybrid between participatory and user-centred design), an approach that ensured the best balance between development needs and our stakeholders' constraints. We also review the challenges we met while conducting such evaluations, mainly in the form of limited time and number of users that our partners could allocate to the system trials. We conclude with a discussion of our evaluation and qualitative data collection that we employed, and present the lessons learnt and implications for future evaluations under similar constraints.

Case Study
The detailed case study presentation is available at: http://www.academia.edu/2433801/Well_take_it_from_here_letting_the_users_take_charge_of_the_evaluation_and_why_that_turned_out_well

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