Design process of a serious game about domestic abuse in the context of the Vulnerable Avatars Framework

Emmanuel Guardiola
Technische Hochschule Köln
Cologne Game Lab
Schanzenstr. 28
51063 Köln, Germany
eg@colognegamelab.de

Jan Stasieńko
AGH University of Krakow
eduVRGameLab
al. Mickiewicza 30
30-059 Kraków, Poland
stasienko@agh.ed.pl

Laura Espinosa Ospina
Technische Hochschule Köln
Cologne Game Lab
Schanzenstr. 28
51063 Köln, Germany
Laura_patricia.espinosa_ospina@smail.th-koeln.de

Keywords

Serious Games; Vulnerable Avatars; Domestic Violence; Avatar Design Framework, Police training; Motion Capture

EXTENDED ABSTRACT

This paper presents a structured method for designing and evaluating emotionally credible virtual victims of domestic violence through a serious game: the Victim Interview Simulator (VIS), developed within the EU-funded ISEDA (Innovative Solutions to Eliminate Domestic Abuse) project. The simulator aims to train police officers in conducting first-contact interviews with victims by providing an interactive environment that realistically communicates the victim's psychological state and supports risk assessment.

Serious games addressing violence have historically focused on awareness-building among youth or the general public, but few tools have been designed for professional training in domestic-violence intervention. Existing methods such as manuals, role-

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play or actor-led videos lack scalability and rarely convey the nuanced nonverbal signals exhibited by real victims. The VIS addresses this gap by implementing sensitive avatars—high-fidelity digital humans whose emotional states are communicated through facial expressions, gestures, and realistic dialogue patterns.

We first review research on serious games dealing with interpersonal violence, the representation of vulnerable groups in games, and the communication of emotions in avatars. Key insights include the importance of participatory design, cultural representativeness, and the risks of stereotyped depictions. Studies show that users can reliably interpret emotions from digital avatars and that immersive technologies can enhance empathy and decision-making in training contexts.

To systematize the ethical and technical aspects of designing vulnerable digital characters, the authors developed the Vulnerable Avatars Framework. It identifies ten contexts of vulnerability, including social and psychological factors, types of oppression, roles in violent situations, and places of intervention. These are mapped onto three game-design layers: aesthetic (avatars, environments, audio), narrative (character histories, dialog design), and systemic (interactive mechanics, trust variables, feedback). The framework also defines contributions from social actors—police officers, psychologists, victim advocates—and game-development roles such as designers, animators, and actors.

Figure 1: screenshot of a scenario being played in the Victim Interview Simulator

The Victim Interview Simulator applies this framework through three scenarios depicting women of different ages, backgrounds, and types of abuse. These scenarios were co-designed with European police agencies, victim-support organizations, and academic partners. Interaction is driven by a stack-based dialogue system that models fluid conversation rather than rigid branching trees. Trust and impatience variables dynamically regulate whether the player can access sensitive topics, such as sexual violence or coercive control.

A major technical achievement of the VIS is the use of MetaHuman technology combined with portable, low-cost markerless facial motion capture. This allowed the

team to record actresses in multiple countries while maintaining consistent animation fidelity. High realism was necessary to convey subtle cues such as guardedness, emotional reactivity or hesitation—key indicators of victim vulnerability.

The paper presents a preliminary evaluation using the Perceived Interpersonal Vulnerability (PIV) scale, developed specifically for this project. The scale measures six dimensions of perceived vulnerability, including general vulnerability (GV), negative affect (NA), emotional reactivity (ER), non-verbal cues (NV), support-seeking (SS), and emotional guardedness (EG). During an ISEDA project closing event, 19 practitioners interacted with one VIS scenario and completed a shortened version of the PIV questionnaire.

Results show that participants consistently perceived the avatar as vulnerable, demonstrated by a high GV median score and a low spread. Among the descriptive subscales, emotional reactivity (ER) received the highest ratings, with the mode of answers lying at the maximum score, suggesting that the players had a strong perception of the avatar's sensitivity and awareness of the emotional consequences of their choices. Nonverbal cues (NV) were reliably detected, indicating that the animation pipeline supported emotional communication. Mixed results for negative affect and support-seeking were attributed to translation issues and single-item measurement in the questionnaire.

Despite several limitations such as a small sample size, an uncontrolled experimental environment, and linguistic mismatch, this preliminary study provides a promising observation where the avatar of the VIS effectively communicated a psychologically vulnerable state, a core objective of the design tied to the desired learning outcomes.

The authors discuss the importance of maintaining strict control over dialog content in sensitive contexts, avoiding AI-generated conversational models that cannot guarantee the learning outcomes.

The conclusion emphasizes that the Vulnerable Avatars Framework offers a design approach for ethically and credibly representing victims of domestic abuse in training-focused serious games. The VIS illustrates how game technologies, performance-based avatar design, and structured expert collaboration can be combined to convey nuanced psychological states and support realistic first-contact interview scenarios. While further research is needed to determine its measurable impact on professional practice, the project demonstrates the feasibility and potential of high-fidelity vulnerable avatars as components of training simulations in the field of domestic-violence intervention.

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