

## Virtual Aunt Vera against misinformation in election campaigns

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**Resumo** – Este estudo explora o uso de humanos virtuais (HVs) como agentes narrativos em campanhas educativas para combater a desinformação eleitoral. Objetivo: A proposta visa adaptar uma campanha existente para um formato audiovisual, apresentando HVs hiper-realistas que fornecem conteúdo verificado por meio de vídeos curtos adaptados para mídias sociais. Metodologia: Combinar apelo visual, personalização e narrativa emocional como estratégia para aumentar o engajamento e incentivar a verificação colaborativa de fatos pelo público. Resultados esperados: A capacidade dos HVs de transmitir informações de forma persuasiva e acessível pode representar um diferencial significativo para a comunicação política no futuro, combatendo consideravelmente a desinformação eleitoral.

Palavras-chave: Desinformação eleitoral; Humanos virtuais; Campanhas educativas; Tecnologias imersivas; Campanhas eleitorais.

**Abstract** – Introduction: This study explores the use of virtual humans (VHs) as narrative agents in educational campaigns to combat electoral disinformation. Goal: The proposal aims in adapting an existing campaign into an audiovisual format, featuring hyper-realistic VHs delivering verified content through short videos tailored for social media. Methodology: Combining visual appeal, personalization, and emotional storytelling as a strategy that enhances engagement and encourages collaborative fact checking by the audience. Expected results: The ability of VHs to convey information in a persuasive and accessible way can represent a significant differentiator for political communication in the future, significantly combating electoral disinformation.

**Keywords:** Electoral disinformation; Virtual humans; Educational campaigns; Immersive technologies; Electoral campaigns.

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## 1. Introduction

Misinformation in electoral contexts is a growing threat to democratic integrity and compromises the formation of opinions and, consequently, the quality of the vote. In a scenario where social media is consolidating as the primary source of information for a large part of the population, manipulated content and fake news spreads rapidly and widely (Aïmeur et al., 2023), which makes it difficult to distinguish between verified information and fabricated ones.

Being aware of the challenge that the identification of fake news is still a complex issue, the present project proposes the creation of an innovative strategy to counter electoral disinformation by making use of Virtual Humans (VHs) as educational campaigns protagonists, (Bilotta et al., 2011). In the context of this work, VHs are hyper-realistic digital characters, created with the most cutting-edge technology to simulate facial expressions and lip movement synchronized with the real audio — in this project, the NVIDIA Omniverse™ Audio2Face technology was used to this purpose. These VHs differ from traditional avatars by their realistic appearance and greater ability to express emotions, (Karuzaki et al., 2021), especially facial ones, as well as their impartiality, since they do not have a continuous public identity such as virtual influencers.

The proposal for this prototype is based on the adaptation of an electoral campaign already consolidated by the Regional Electoral Court of Sergipe — "Aunt Vera Against misinformation in the Elections" —, transforming it into a series of short videos optimized for social networks. These videos, mediated by HVs, combine verified information with modern visual language and emotional storytelling, expanding the potential for engagement and message retention. The project blends technological innovation, media literacy, and public participation, aiming to strengthening trust in the electoral process and promoting informed voting in a digital environment saturated with fake news.

In addition to informing, the content produced by this prototype aims to contribute to the public's media education, promoting critical reflection on the origin and reliability of the information consumed. In this way, HVs take on the role of strategic educational mediators, capable not only of delivering the message, but also guiding the population on how to identify signs of misinformation and value reliable sources.

## 2. Methodology

We show details of methodological procedure.

## 2.1 Bibliographic Review and Theoretical Foundation

The first axis of the methodology seeks to build a solid epistemological base, anchored in academic studies on misinformation in digital environments (Lazer et al, 2018), trust and credibility in virtual interfaces (Yang et al. 2023) and the impact of emotional audiovisual narratives in educational (Moyer-Gusé and Nabi, 2010).

At the same time, reviews are conducted on the emergence of technologies aimed at creating and animating VHs, demonstrating how these tools have been applied in areas such as marketing, public health and media education (Moon et al. 2024; Cao et al., 2022; Byun and Ahn 2023). Recent studies also highlight the relevance of cultural personalization and the use of digital avatars in increasing engagement and message retention (Gao et al. 2022; Katz et al., 2022).

## 2.2 Technical Development and Audiovisual Prototyping

The second methodological axis focuses on the technical development of the audiovisual campaign prototype, with a pipeline structured in different stages:

- **Extraction and curation** of audio from pre-existing radio election campaign;
- **Creation and customization** of realistic HVs using MetaHuman Creator (Epic Games 2024), considering elements such as age range, facial expressions consistent with the emotional charge of the message and cultural codes representative of the target audience (Serelle and Soares, 2018; Wang and Fong 2021);
- **Automated lip-sync** using Nvidia Audio2Face, ensuring cohesion between the sound content and the HV's facial expression (NVIDIA, 2024; Lin and Zhou 2024);
- **Construction of immersive virtual scenarios** using Unreal Engine (Epic Games, 2024), ensuring an environment consistent with the original messages, figure 1;
- **Narrative editing** with the inclusion of captions, explanatory graphics and visual reinforcement elements, contributing to the understanding and engagement of the public (Schwind et al. 2020; Cao et al. 2022).

Figure 1 — Cutouts of the scenes created in Unreal Engine

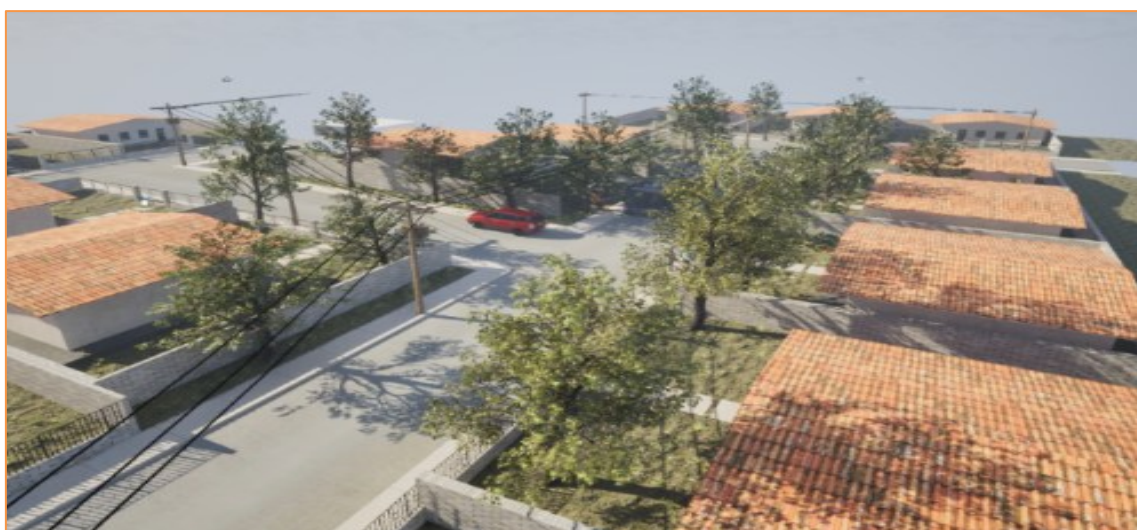
(a) Scene at the bus stop



(b) Scene at the fair



(c) Top view



(d) Scene at the kitchen



Figures 1(a–d) illustrate the immersive virtual environments built in Unreal Engine (Epic Games, 2024), designed to ensure consistency with the original campaign messages. Figure 1(a) represents a bus stop, representing everyday situations related to urban mobility, while Figure 1(b) portrays a street market, highlighting the community and social context. Figure 1(c) presents a top view of the virtual environment, emphasizing the spatial organization of the scenario, and Figure 1(d) shows the interior of a kitchen, underscoring the domestic setting. These scenarios were integrated with realistic human virtual characters (HVs), created and customized in MetaHuman Creator (Epic Games, 2024), considering aspects such as age range, facial expressions consistent with the emotional charge of the messages, and cultural codes representative of the target audience (Serelle and Soares, 2018; Wang and Fong, 2021).

Furthermore, the automatic synchronization between audio — extracted and curated from pre-existing radio campaigns — and the HVs' facial expressions was performed using Nvidia Audio2Face technology (NVIDIA, 2024; Lin and Zhou, 2024), ensuring cohesion between sound and image. Finally, the scenes were incorporated into the narrative editing stage, including captions, explanatory graphics, and visual reinforcement elements (Schwind et al., 2020; Cao et al., 2022), enhancing public understanding and engagement.

### **2.3 Pre-consolidated electoral campaign**

The electoral campaign already consolidated by the Regional Electoral Court of Sergipe was conceived by i9SE, with support from the Government Innovation Laboratory of the National School of Public Administration (Enap), GNova Lab and the Commission to Combat Disinformation, chaired by TRE-SE member judge Hélio Mesquita.

The project "Aunt Vera against misinformation in electoral campaigns" aired 8 spots (radio commercials), in which the character Aunt Vera, in a playful way, guides listeners about the elections with the aim of informing and alerting the population about the importance of the elections and the dangers that fake news causes.

## **3. DEVELOPMENT**

Here we report tasks included on development.

### **3.1 Creation and Customization of Virtual Humans**

The first stage of the process consists of the semiotic transposition of characters originally conceived for radio into hyper-realistic visual representations. This process takes into account several crucial aspects, such as: Age range and characteristic phenotype which give identity and authenticity to the characters (Katz et al., 2022). Visual style that must be aligned with the aesthetic perception of the target audience (Mori et al., 2012). Facial expressions and gestures calibrated to enhance the empathy generated by the virtual character (Ferstl et al. 2021; Bailenson et al., 2023).

To enable this modeling, the MetaHuman Creator tool is used as the main platform. Furthermore, pre-existing audio is converted into realistic facial performance, which is one of the central challenges of the prototype. To this end, Nvidia Audio2Face

is used, which employs machine learning algorithms to map the prosodic characteristics of the audio (such as rhythm and intonation) directly onto the lip movements of the virtual character (NVIDIA, 2024); Lin and Zhou, 2024). This workflow is enhanced through facial capture sessions using Live Link Face, which allows the insertion of human microexpressions in real time. In this way, HVs become even more expressive, bringing their performances closer to the naturalness of human communication (Koda and Ishibashi, 2024).

#### 4. RESULTS

Although the project is still in its early stages as a prototype, systematic reviews indicate that the use of VHs in health and education campaigns has shown great potential to increase engagement, especially when emotional appeal and cultural personalization are combined (Byun and Ahn, 2023; Moon et al., 2024; Cao et al., 2022). Transposing this approach into an electoral context can strengthen the effectiveness of political messages in highly saturated digital environments by misinformation (Serelle and Soares, 2018). Despite the innovative potential of HVs, some critical challenges need to be considered to ensure their acceptance and ethical use. Among the main points of attention, the following stand out:

- **Uncanny Valley and Aesthetic Rejection:** Even with significant advances in facial realism, there is still a risk of perceptual discomfort on the part of the audience, which can limit the effectiveness of HVs (Mori et al., 2012; Bailenson et al., 2023).
- **Trust and credibility:** Unlike traditional human figures, HVs do not have a digital history that can support their authenticity. This lack of a "digital biography" can compromise their credibility as reliable sources of information (Yang et al., 2023; Wurtz and Campbell, 2021).
- **Political ambiguity and perception of manipulation:** The use of HVs in institutional campaigns can generate negative reading among the public, interpreted as a mechanism of algorithmic manipulation, causing distrust among the voters (Aral, 2021; Geiger and Torrez, 2023).

#### 5. CONCLUSION

The use of Virtual Humans (VHs) in campaigns against electoral misinformation represents not only a significant technological advancement but also an innovative way to transform public communication. By integrating these digital agents into new media technologies, this project seeks to make electoral discourse more accessible, reliable, and engaging.

Despite its promising potential, this research acknowledges certain limitations. As an early-stage prototype, the current study did not include empirical validation with the target audience. Specifically, the absence of focus groups means that the direct impact and public acceptance of Virtual Humans still need to be formally assessed in future work. Furthermore, although the project already employs well-developed technological tools, the rapid evolution of generative Artificial Intelligence, AI, suggests that future iterations could benefit from even more sophisticated rendering and machine learning resources, which were beyond the scope of this initial research phase. These points represent current limitations that future studies intend to address.

Looking ahead, upcoming research will focus on several key areas to build upon the foundations established by this study. A primary focus will be empirical validation through focus groups to rigorously assess the feasibility of the concept and user acceptance before the electoral period. The project also plans to explore how these tools can be used in education, especially in schools, to help young people develop media literacy skills and better recognize misinformation. Further investigations will include comparative studies to evaluate the impact of Virtual Human mediated campaigns against traditional communication strategies, ensuring more authentic and representative communication with diverse segments of the electorate.

The project also plans to expand the use of Virtual Humans in both education and social media. In schools, these digital agents could help younger generations develop media literacy skills, making it easier to understand and identify misinformation in election campaigns. On social media, using VHs in campaigns could increase public engagement and participation, supporting broader efforts to improve online communication (Aral, 2021). In sum, these next steps aim to keep improving the technology and communication behind Virtual Humans, making them valuable allies in the fight against misinformation and in promoting more transparent and participatory elections.

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