Identity Management in Virtual Worlds Based on Biometrics Watermarking

Authors : S. Bader, N. Essoukri Ben Amara

Abstract : With the technological development and rise of virtual worlds, these spaces are becoming more and more attractive for cybercriminals, hidden behind avatars and fictitious identities. Since access to these spaces is not restricted or controlled, some impostors take advantage of gaining unauthorized access and practicing cyber criminality. This paper proposes an identity management approach for securing access to virtual worlds. The major purpose of the suggested solution is to install a strong security mechanism to protect virtual identities represented by avatars. Thus, only legitimate users, through their corresponding avatars, are allowed to access the platform resources. Access is controlled by integrating an authentication process based on biometrics. In the request process for registration, a user fingerprint is enrolled and then encrypted into a watermark utilizing a cancelable and non-invertible algorithm for its protection. After a user personalizes their representative character, the biometric mark is embedded into the avatar through a watermarking procedure. The authenticity of the avatar identity is verified when it requests authorization for access. We have evaluated the proposed approach on a dataset of avatars from various virtual worlds, and we have registered promising performance results in terms of authentication accuracy, acceptation and rejection rates.

Keywords : identity management, security, biometrics authentication and authorization, avatar, virtual world
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020