Popular Science Summary

Anticipating Privacy in the development of 3D Scene Graphs

Personal information protection is of utmost importance as we explore the innovative world of 3D Scene Graphs (3DSG).

This new technology creates realistic representations of environments, reflecting how humans understand things. In this master thesis, I highlight how import it is to think about keeping personal information safe as developers create new technologies. Imagine a world where technology can transport you to incredibly realistic architectural representations, capturing every tiny detail with exceptional precision. In the world of digital innovations, there is a new technology known as 3DSG, which not only creates powerful representations of 3D environments but also tries to make sense of these spaces. These future designs try to imitate how humans understand situations and are anticipated to redefine how we interact with the world and extract meaning from it. However, there's a critical aspect that needs out immediate attention: privacy. We need to address these growing worries about keeping personal information safe.

For my study, I looked into a new framework known as Hydra, which makes real-time 3D representation of its surroundings and helps in the extraction of useful information when creating visuals. The problem with this technology is that it involves collecting, processing, and storing data in new ways we're not used to, which might make people feel uncomfortable. To address this, I did a thorough study on Hydra using a method called LINDDUN, which investigates seven privacy threat categories: Linkability, Identifiability, Non-repudiation, Detectability, Data disclosure, Unawareness and Non-compliance. My main goals were to identify potential privacy threats and suggest some solutions for them. The findings and suggestions can guide in making privacy measures for 3DSG, ensuring we keep privacy in mind as technology keeps on advancing. In summary, my work brings attention to the importance of protecting personal information as 3DSG become a reality and the need for appropriate solutions.