

# Applications of VR (Virtual Reality) Technology for Detection, Investigation, and Rehabilitation

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## EXECUTIVE SUMMARY

*This chapter explores the extensive use of virtual reality (VR) technology within the UK's criminal justice system, focusing on its applications in investigation, correction, and rehabilitation. Driven by the need for efficient training solutions, VR is employed for crime scene reconstruction, inmate rehabilitation, and offender reintegration, as illustrated through case studies and scholarly literature. The chapter delves into the intersection of VR technology with various aspects of the criminal justice system, emphasizing its potential to improve investigative practices, enhance correctional outcomes, and support offender rehabilitation. It encompasses the technical capabilities of VR, its applications in criminal investigation, forensics, correctional facility management, and offender treatment programs, while also addressing ethical considerations and best practices for implementation. By harnessing the power of VR, the UK's criminal justice system can transform its approach to investigation, corrections, and rehabilitation.*

## **INTRODUCTION**

Virtual Reality (VR) has emerged as a powerful tool in various fields, and its potential to aid the detection and avoidance of offender behaviour has been recognised by researchers and law enforcement agencies (Gelder et al., 2019). The UK criminal justice system, like many others, faces significant challenges, including limited resources, rising costs, and the need for effective rehabilitation and reintegration programmes. In 2019, the total cost of the criminal justice system in England and Wales was approximately £28.8 billion, with recidivism rates remaining high at around 28% (Ministry of Justice, 2029). These challenges highlight the importance of adopting innovative technological solutions to enhance investigative practices, improve correctional outcomes, and support offender rehabilitation.

The use of immersive simulations is not a novel concept. Scenarios designed to serve as effective strategies for detecting offenders, preventing recidivism, and informing best practices for higher-risk offending behaviours, such as sexual assault, rape, or child/sexual molestation, have primarily been developed for desktop-based systems (Asadzadeh et al., 2022; Gelder et al., 2019). While studies suggest that 2D learning is beneficial both from cost-effective means and easier to design, prepare and implement, VR can enhance learning by providing hands-on experiences and visualising complex concepts, which may not be possible with 2D.

VR can be defined as a computer-generated simulation of a three-dimensional environment that can be interacted within a seemingly real or physical way using specialised electronic equipment, such as a headset with a screen or gloves fitted with sensors (Cao, 2016; Ojha, 1994). Significant brands include Meta's Oculus Quest (Meta Quest, n.d) and Apple's rumored mixed reality headset (XR). This style of headsets encompasses a sense of presence, allowing users to experience and manipulate virtual objects or environments as if they were real, engaging multiple senses, including sight, sound, and sometimes touch (Biocca & Delaney, 1995; Burdea & Coiffet, 2003). This immersive and genuine experience of VR is essential for accurately comprehending and forecasting offenders' conduct, making VR a more appropriate step in accommodating different learning styles and abilities and allowing for personalised and adaptive learning experiences.

Advancements in technology for VR and immersive simulations have made it easier, more cost-effective, and accessible to obtain and learn how to use such platforms, making them ubiquitous assets for training and research. Ongoing progress in VR technology within gaming engine software and specialised peer platforms has enabled researchers to explore a wide range of complex designs and manipulations within a controlled, ethical, and respectful environment. The use of controlled environments in VR has been proven to enhance information retention, situational

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