International Journal of Trend in Scientific Research and Development (IJTSRD)
Volume 9 Issue 4, Jul-Aug 2025 Available Online: www.ijtsrd.com e-ISSN: 2456 – 6470

Immersive Technologies in Law Enforcement

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ABSTRACT

The rise of virtual reality (VR) and augmented reality (AR) is transforming many fields, including that of law enforcement. These immersive technologies offer unprecedented possibilities for training, intervention, and investigation, paving the way for more efficient and secure methods. They are revolutionizing how law enforcement officers train and law enforcement practices. Implementing immersive technologies in law enforcement training has shown tangible benefits in both learning outcomes and field performance. They are reshaping training of law enforcement agencies by providing immersive and authentic experiences, overcoming many traditional training limitations. In this paper, we will explore the positive impact of immersive technologies on law enforcement agencies.

KEYWORDS: *virtual reality, VR, augmented reality, AR, mixed reality, MR, extended reality, XR, immersive technologies, law enforcement, police training.*

How to cite this paper: Matthew N. O. Sadiku | Paul A. Adekunte | Janet O. Sadiku "Immersive Technologies in Law Enforcement" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-9 | Issue-4, August 2025, pp.745-757, URL: www.ijtsrd.com/papers/ijtsrd97331.pdf

IJTSRD97331

INTRODUCTION

Police officers play a vital role in maintaining safety, order, and harmony in our communities. They display courage, professionalism, and dedication in their daily work, often risking their lives to protect and serve the public. Figure 1 shows a police officer [1]. The demand for law enforcement continues to grow, and agencies across the country are turning to innovative technologies to improve officer preparedness and public safety. Traditional training methods, while valuable, often fall short in replicating the stress, unpredictability, and variety of real-life encounters officers face daily. That is where immersive simulation steps in. With immersive technologies such as virtual reality (VR), departments can reduce risk, improve consistency, and better prepare officers without the logistical challenges of real-world exercises. Although training simulation has been in use by law enforcement for over 30 years, it was not until less than a decade ago that improvements were made to elevate to fully immersive virtual reality [2]. Figure 2 shows a representation of immersive technology [3].

WHAT ARE IMMERSIVE TECHNOLOGIES?

The first step in understanding how to use immersive technologies is to learn the differences between various forms. In their simplest form, immersive technologies consist in adding virtual objects to the real world. There are four types of digital realities leading to different types of immersive technologies [4,5]:

- *Augmented reality* (AR)- designed to add digital elements over real-world views with limited interaction.
- *Virtual reality* (VR)- immersive experiences helping to isolate users from the real world, usually via a headset device and headphones designed for such activities.
- *Mixed reality* (MR)- combining AR and VR elements so that digital objects can interact with the real world means businesses can design elements anchored within a real environment.
- *Extended reality* (XR)- covering all types of technologies that enhance our senses, including the three types previously mentioned.

These devices also enable new user interactions including spatially tracked 3D controllers, voice inputs, gaze tracking, and hand gesture controls.

Extended reality (XR) is the overarching term used to describe employing technology to blend real life and the digital world. It includes all the machine-human interfaces beyond the physical realm (reality) such as augmented reality (AR), mixed reality (MR), assisted reality (aR), and virtual reality (VR), as illustrated in Figure 3 [6]. Figure 4 shows the XR spectrum [7]. Immersive technologies reside along a continuous scale ranging between the completely real and the completely virtual world. At one end, the real environment refers to the actual physical space, objects, and people that exist in the tangible world around us. At the other end, the virtual environment represents a completely computer-generated and immersive digital space, distinct from the physical reality. The space in the middle is called mixed reality, which is a blend of the real and virtual environments, where digital and physical elements coexist and interact in real time. A range of devices makes up XR, and these are used by consumers and in many industries for entertainment, safety, training, or productivity purposes.

1. *VIRTUAL REALITY:* Virtual reality (VR) is XR at its most extreme. It completely immerses the user in a digital world, often using a computer-generated environment with scenes and objects that appear to be real. The term "virtual reality" essentially means "near-reality." Virtual reality is the key technology for experiencing sensations of sight, hearing, and touch of the past, present, and future. VR is a fully immersive technology where users wear a head-mounted display and experience a simulated world of imagery and sounds. VR enables active learning. The terms, "virtual reality" and "cyberspace" are often used interchangeably. A cyberspace may be regarded as a networked virtual reality. A person using virtual reality can look around an artificial world, move around it, and interact with virtual features or items. This effect is commonly created by virtual reality headsets. Head-mounted displays immerse the user in a virtual environment. Virtual reality is a simulated experience that can be similar to or different from the real world. It is a computer-generated, 3D environment that completely immerses the senses of sight, sound, and touch. The complete immersion of the senses overwhelms users engrossing them in the action. Virtual reality technology includes multiple components divided into two main groups: hardware and software components [8].

   - *Hardware Components:* The hardware components include a computer workstation, sensory displays, a tracking system, wearable devices, and input devices. Sensory displays are used to display the simulated virtual worlds to the user. The most common type is the head-mounted displays (HMDs), which is used in combination with tracking systems. Head-mounted displays are shown in Figure 5 [9]. Users interact with the simulated environment through some wearable devices. VR depends on special responses such as raising hands, turning the head, or swinging the body. A wearable device is important in making these effects realistic. Special input devices are required to interact with the virtual world. These include the 3D mouse, the wired glove, motion controllers, and optical tracking sensors. These devices are used to stimulate our senses together to create the illusion of reality.

   - *Software Components:* Besides the hardware, the underlying software plays an important role. It is responsible for the managing of I/O devices and time-critical applications. The software components are 3D modeling software, 2D graphics software, digital sound editing software, and VR simulation software. VR technology has been designed to ensure visual comfort and ergonomic usage.

2. *AUGMENTED REALITY:* Augmented reality (AR) is a technology that combines real-world environments with computer-generated generated information such as images, text, videos, animations, and sound. It can record and analyze the environment in real-time. In augmented reality, the user typically experiences the real world through a device such as a smartphone, tablet, smart glasses, or head-mounted display. For example, AR allows consumers to visualize a product in more detail before they purchase it. This feature enhances consumer interaction and helps them never to repurchase the wrong item. The key objective of AR is to bring computer-generated objects into the real world and allows the user only to see them. In other words, we use AR to track the position and orientation of the user's head to enhance/augment their perception of the world. Augmented reality falls into two categories: 2D information overlays and 3D presentations, like those used with games. AR blends the virtual and real worlds by overlaying digital objects and information onto the users' view of the physical world.

To obtain a sufficiently accurate representation of reality, AR needs the following five components [10]:

- *Sensors:* AR needs suitable sensors in the environment and possibly on a user, including fine-grained geolocation and image recognition. These are activating elements that trigger the display of virtual information.
- *Image augmentation:* This requires techniques such as image processing and face recognition.
- *Head-mounted Display*: HMDs are used to view the augmented world where the virtual computer-generated information is properly aligned with the real world. Display technologies are of two types: video display and optical see-through display.
- *User Interface:* This includes technologies for input modalities that include gaze tracking, touch, and gesture. AR is a user interface technology in which a camera-recorded view of the real world is augmented with computer-generated content such as graphics, animations, and 2D or 3D models.
- *Information infrastructure:* AR requires significant computing and communications infrastructure undergirding all these technologies. The infrastructure determines what real-world components to augment, with what, and when.

3. *MIXED REALITY:* Mixed reality (MR) is a term used to describe the merging of a real-world environment and a computer-generated one. Physical and virtual objects may co-exist in mixed reality environments and interact in real time. This is an extension of AR that allows real and virtual elements to interact in an environment. MR liberates us from screen-bound experiences by offering instinctual interactions with data in our living spaces and with our friends. Online explorers, in hundreds of millions around the world, have experienced mixed reality through their handheld devices. Mixed reality is a blend of physical and digital worlds, unlocking natural and intuitive 3D human, computer, and environmental interactions, as shown in Figure 6 [11] and Figure 7 [12]. This new reality is based on advancements in computer vision, graphical processing, display technologies, input systems, and cloud computing. Mixed reality has been used in applications across fields including design, education, entertainment, military training, healthcare, product content management, and human-in-the-loop operation of robots [13].
4. *ASSISTED REALITY:* Like mixed reality, assisted reality (aR) is an extension of augmented reality, with a few notable differences to both. One of these differences is that aR is primarily hands-free through the wearing of a headset, whereas AR usually requires the holding of a device such as a mobile phone. While MR is a digital-first, real-world second reality, aR is a real-world first system. It combines software and a head-mounted display. It is best experienced using smart glasses or other wearable technology. The aR market is growing rapidly and promises to be the next great leap to boost workers' productivity. A worker wearing an aR device is shown in Figure 8 [14].
5. *EXTENDED REALITY:* The term "extended reality" (XR) has recently gained favor as an umbrella term that encompasses all of AR, VR, and MR. The primary user inputs for XR devices are described as follows. Voice interfaces are now ubiquitous thanks to mobile devices and standalone smart speakers. Apple's Siri, Amazon's Alexa, Google's Assistant, and Microsoft's Cortana are all voice-driven software interfaces that are continuously gaining new capabilities. Many XR devices enable user control with handheld controllers, which have capabilities beyond button press inputs. Both voice-driven interfaces and human-computer interactions have been developed specifically for XR devices, including gaze and gesture controls [15]. Figure 9 compares conventional computing with extended reality [15].

IMMERSIVE TECHNOLOGY IN LAW ENFORCEMENT

The demand for law enforcement continues to grow, and agencies across the country are turning to innovative technologies to improve officer preparedness and public safety. One of the most impactful innovations reshaping the training landscape is immersive simulation training. Traditional law enforcement training, centered on physical and technical skills, frequently neglects mental resilience, stress management, and cognitive agility – all critical in high-stakes environments. Such training is currently delivered mainly using traditional methods such as modelling and "role-playing" possible scenarios in the physical world. Figure 10 shows a typical example of traditional police training [16]. Traditional methods of practical police training are costly, time-consuming, and challenging to scale in size. For these reasons, they may be less effective and less frequently delivered than is desirable.

Equipped with VR headsets and immersive technology platforms, officers can practice handling realistic situations like active shooter events, de-escalation of conflicts, or crowd control in a risk-free, controlled environment. Adopting virtual reality training in law enforcement is not just a technological trend—it is necessary for preparing officers to tackle 21st-century challenges. Such virtual reality training

is depicted in Figure 11 [17]. This training would use virtual reality technology to mimic every aspect of today's police academy from the comfort of one's home. VR police training systems are offering the enhancement of sessions at a lower cost.

While virtual reality allows for the recreation of complete environments for training and simulations, augmented reality provides powerful tools for crime analysis and resolution by superimposing virtual elements onto the real world. Unlike virtual reality, which completely replaces our environment, augmented reality enriches it with additional information and elements [18]. Virtual and extended reality (VR/XR) headsets have promised to enhance police training through the delivery of immersive simulations able to be conducted anywhere, anytime.

APPLICATIONS OF IMMERSIVE TECHNOLOGY IN LAW ENFORCEMENT

Virtual reality is rapidly transforming police training and readiness in profound ways. Common applications of immersive technologies in policing include the following [19-21]:

- *Police Training*: One of the key uses of VR in policing is scenario-based training. Training is at the heart of effective law enforcement. It is important that officers receive proper training to carry out their duties safely and effectively. Effective police training is essential, as it has a critical dual purpose: to ensure the safety of officers and the communities they serve. Traditional training often relies on classroom lectures and simulated scenarios that lack the realism necessary to prepare officers for the chaotic and high-stress environments they encounter in the field, leading to unsatisfactory results. Emerging technology, specifically virtual reality (VR), offers a dynamic and immersive learning environment that simulates real-world scenarios, allowing officers to practice and refine their skills in a safe and controlled setting. Departments can run complex scenarios that would be impractical to stage live, and officers can "fail" safely and learn from mistakes without real-world consequences. Unlike traditional training simulators, immersive training integrates real-world weapons, ensuring officers train with the same tools they use in the field.
- *Police Readiness*: Beyond training individual skills, VR is also a tool for tactical planning and operational preparedness. Officers face unpredictable and high-stakes situations daily, requiring top-notch preparedness, quick decision-making, and tactical precision. The VR technology serves as a mission planning and visualization tool, enhancing preparedness for real missions. Police departments are increasingly turning to virtual reality (VR) to enhance officer readiness. VR offers immersive training experiences that mimic real-world policing scenarios with high fidelity, yet in a safe, controlled environment. The result is more frequent, varied training that officers find highly engaging, leading to significantly higher knowledge retention and improved preparedness.
- *Identification:* The use of augmented reality is being applied to fingerprinting and suspect identification. Rather than taking days or even weeks to identify evidence such as fingerprints at crime scenes, the job can be done in a far shorter period, speeding up the investigation. In China, augmented reality glasses combined with facial recognition software can help patrol officers immediately identify suspects on the street. The glasses give officers access to national databases in real-time at checkpoints.
- *Crime Scene Analysis:* Virtual reality helps officers get ready for real-life situations, like robberies and crimes. VR technology is now used in crime scene work. It helps law enforcement by making detailed virtual crime scenes. This lets them understand the scene better and make smarter decisions. Figure 12 shows a typical crime scene [22].

BENEFITS

VR technology can provide a significant boost to police training due to its ability to create realistic scenarios. Regardless of an officer's career stage, they can benefit from VR as it offers an immersive and effective learning experience. One major advantage is improved knowledge retention and skill acquisition. Immersive VR engages officers in *active* learning (learning by doing), which dramatically boosts retention rates. VR also permits more frequent practice (since scenarios can be run anytime without elaborate setup), which builds proficiency. Other benefits include the following [19]:

- *Enhanced Safety:* According to a survey conducted by the US Department of Justice, 90% of law enforcement agencies believe that virtual reality technology improves officer safety during training by significantly reducing the likelihood of accidents or injuries. By minimizing the situational risks involved in training exercises, VR almost eliminates the potential for officers to get injured.
- *Cost-Effective Training*: Another major benefits is cost and resource efficiency. Although VR

systems require upfront investment, agencies find that they can reduce ongoing training costs significantly. VR reduces recurring costs such as ammunition, travel, and facility use associated with traditional training. Traditional police training (e.g. live exercises or role-play) can be costly and logistically difficult, whereas VR training offers a budget-friendly alternative to traditional training requirements, such as equipment, ammunition, equipment, maintenance, and logistics. The Australian Federal Police (AFP) is an excellent example that has adopted VR training for high-risk scenarios, such as counter-terrorism operations. By using VR, they have significantly reduced the costs associated with conducting large-scale tactical training exercises. As VR costs gradually come down, even mid-size and small police departments are starting to adopt these tools. The investment is justified by the outcomes: better-prepared officers, more efficient training delivery, and ultimately, safer communities.

- *Enhanced Decision-Making*: In high-pressure situations decision-making is vital. Split-second decision-making can mean the difference between life and death in policing. VR scenario training builds muscle memory and decision-making skills so that when a real incident occurs, officers have essentially "been there before" in VR. VR-based training has been found to improve an officer's decision-making abilities in high-pressure situations. According to a study conducted by Arizona State University, officers who underwent training on use-of-force decision-making using virtual reality showed a 48% reduction in the use of force during simulated encounters compared to those who received traditional training. The simulation system monitors their actions and can branch the scenario dynamically – instructors can escalate or de-escalate the virtual situation based on the officer's responses. This means trainees experience the consequences of their decisions in real time. The immersiveness of VR forces officers to make split-second decisions just as they would on duty.
- *Personalized Training:* VR allows for customized training scenarios that can adapt to an officer's skill level, providing tailored learning experiences. Adaptive VR training can lead to improved skill acquisition, as it challenges officers at an appropriate level and provides instant feedback.
- *Mental Health Training:* Advanced VR systems now include scenarios that train officers on how to identify and respond to individuals experiencing autism, anxiety, schizophrenia, and other mental health challenges.
- *Scalability:* VR is scalable; it can be used by a department of any size. Large departments appreciate the efficiency, while small agencies benefit by gaining access to advanced training that they otherwise could not afford or logistically support. It enables scalable, effective, and safe preparation for the increasingly complex situations they face.

CHALLENGES

Transitioning the basic police academy fully into the metaverse brings many challenges. Certain challenges need to be addressed, such as skepticism, cybersecurity, high operation costs, integrating VR with traditional methods, and ensuring accessibility and affordability. Increased reliance on AR technology can pose problems in case of technical malfunctions or cyberattacks. Other challenges include the following [23,24]:

- *Privacy Issues:* AR collects biometric and behavioral data, raising concerns about the confidentiality of sensitive information. VR collects detailed biometric data, such as eye movement and gesture tracking, which can be exploited in case of a data breach.
- *Health Issues:* Prolonged use of VR can lead to side effects such as eye strain, headaches, and nausea, impacting user performance. If disregarded, physical health and safety requirements may become a vulnerability resulting in harm,
- *Cybersecurity:* This is vital to ensure the protection of vast amounts of personal information and the digital infrastructure itself. VR platforms can be targeted by ransomware or cybercriminals, endangering users' personal information and security. The metaverse will be prone to hacking, phishing and malware attacks. These types of attacks can harm individual users and destroy digital assets.
- *High Cost:* The development and implementation of AR technologies can be expensive, limiting their accessibility for certain units or services. Operational costs must be considered. These include ongoing maintenance of the virtual environment, updates to the curriculum and technical and physical support for recruits and instructors.
- *Authenticity*: A general vulnerability of virtual training simulation is that it may not fully

approximate the variety of events and reactions that could be expected in a given scenario - effectively failing to authentically recreate how the scenario would occur in reality. This could lead to incorrect behaviors (e.g. decision making) being adopted by trainees.

- *Staffing Shortage:* A dangerously high number of police officer vacancies remain unfilled due to a lack of interest and applicant qualifications. This staffing shortage has led to burnout among officers, who are often required to work overtime, further exacerbating the problem. Police officers who experience burnout show symptoms of exhaustion, decreased productivity, job dissatisfaction and cynicism. In light of these recruitment challenges, it is crucial to explore alternative measures to attract applicants to this noble profession. To attract a greater number of young applicants into law enforcement, modernizing the police academy format within the digital realm may help. Today the ranks of law enforcement are filled with Baby Boomers and digital natives. Digital native applicants must see a training regimen presented in ways to which they are accustomed.
- *Bias:* Objective-based scenarios center around the importance of approaching investigations with an unbiased perspective. Police officers need training around race as this is the greatest cancer in this land. Immersive technology can put officers in the body/mind of a black person who is being pulled over during a routine traffic stop. We gain empathy and a more comprehensive understanding of the human experience by embodying multiple and seemingly incompatible perspectives. Immersive experience could better prepare officers for real world scenarios.
- *Communication:* Communication is a key competence for police officers, without which they cannot effectively perform many of their duties. In their daily work, police officers are often confronted with complex situations. Adequate communication skills are an essential safety resource for police officers and can significantly reduce the risk for police officers during their missions. Inadequate or misused communication carries the risk of triggering serious conflicts. Police response teams are often the first on the scene and are confronted with complex and potentially dangerous situations that have a high potential for conflict. The ability to communicate in a targeted manner can have a far-reaching influence on the quality and outcome of operations. VR technology can enable or enhance communication training.
- *Realism:* Realistic training scenarios are needed to ensure adequate preparation for real police operations. This includes the highly complex and stressful nature of police operations, as well as the inclusion of realistic and ideally inter-agency teams, as they occur in real operations. This ensures that the skills learned can be successfully recalled in real operations. The realistic presentation and high level of control over training scenarios are distinguishing features and significant advantages of VR. Communication in highly complex and dangerous situations, which emergency forces are often confronted with, can be trained realistically.

GLOBAL IMPACT OF IMMERSIVE TECHNOLOGIES IN POLICING

Facing a critical shortage of officers and evolving challenges, law enforcement agencies worldwide are reevaluating their training methods. Traditional approaches, often focused on physical and technical skills, lack the cognitive stimuli for the complexities of modern policing. The integration of immersive technologies is going to change law enforcement across the world. Virtual reality is making officers' training in a fully virtual world an emerging reality for departments worldwide. The following international examples demonstrate how immersive technologies are used globally [20,25,26]:

- *United States:* Departments such as the Boston University Police Department and the Johnson County Sheriff's Office have already integrated VR programs into their training curriculum. These programs offer immersive, repeatable, and data-driven scenarios that allow officers to build confidence in a controlled environment. Similarly, the Denver Police Department showcased their use of VR to train new recruits with an emphasis on real-world readiness and de-escalation tactics.
- *United Kingdom:* In the UK, VR is used to build empathy and improve handling of sensitive cases. There are also a small number of cases in England and Wales of using virtual reality for police training. In 2021, the Greater Manchester Police (GMP) introduced a virtual reality training pilot to help officers understand and empathize with hate crime victims. GMP has embraced VR to train officers and allied professionals on understanding domestic abuse and coercive control. Trainees – including police officers, social workers, and prosecutors – experience the subtle signs of coercive control (isolation,

intimidation, psychological abuse) in an interactive VR scenario based on real survivor accounts. The immersive experience proved eye-opening.

- *Germany:* German police academies are exploring VR for a variety of training needs. Notably, the Hamburg Police Academy launched a VR program in 2024 to train officers in recognizing and responding to hate crimes. This initiative was directly inspired by Greater Manchester's coercive control VR project – Hamburg observed GMP's results and decided to incorporate VR to gain similarly profound insights on hate crime dynamics. Police have partnered with a simulation company (Hologate) to integrate immersive VR into tactical training, reflecting a nationwide interest in leveraging VR for modernizing police education.
- *Czech Republic:* In 2023, the Police of the Czech Republic embarked on a *groundbreaking* VR training initiative for its SWAT units, building an immersive program to improve tactical readiness. The project created detailed virtual environments replicating high-risk scenarios (hostage rescues, armed standoffs, etc.) in which Czech officers must coordinate and make split-second decisions. By training in these realistic, high-pressure VR simulations, the SWAT team enhanced their decision-making, teamwork, and strategy planning without the costs and risks of live exercises.
- *Australia:* The Western Australia Police Force adopted Operator XR's OP-1 Virtual Reality Training System to enhance training for operational tactics, de-escalation, and use-of-force scenarios. This system is used multiple areas of the agency, helping to prepare over 7,000 officers across a vast jurisdiction.
- *Middle East:* Police forces in the Middle East have shown interest in VR. The Abu Dhabi Police in the UAE, for example, established a virtual training center to incorporate VR into routine officer training (from shooting practice to incident management). Dubai's police force, known for tech-forward approaches, has similarly experimented with VR demonstrations for tactical situations in public exhibitions, signaling future adoption in formal training. As proof of law enforcement's interest in the metaverse, in March 2022, the United Arab Emirates and France organized the first international virtual security exercise in this digital universe. Members of the French National Police and Gendarmerie participated in this event, virtually bringing together nine countries of the International Security Alliance (ISA).
- *Norway:* In Oslo, Norway, INTERPOL is capitalizing on the many benefits of immersive learning to train law enforcement officers around the world on intellectual property (IP) crime investigations. Developed by INTERPOL, under the umbrella of the International IP Crime Investigators College (IIPCIC), the immersive learning training sessions take trainees from a virtual INTERPOL classroom to operational locations such as warehouses, crime scenes, and crime labs. Officers are guided through the inspection and investigation process, where they can safely pick up counterfeit goods and examine potentially fraudulent documents.
- *China:* In China, AR glasses are being combined with artificial intelligence (AI) and facial recognition software to help police officers on the streets identify suspects. The glasses – which look like sunglasses – allow police officers to access national database information such as facial recognition and ID card data and vehicle plate information, all in real-time. The idea is to catch suspects and people traveling under false identities. Of course, there are huge privacy concerns around this sort of usage, and the technology is clearly open to misuse. But there is no denying it is a powerful example of how AR can equip officers with valuable real-time information.

CONCLUSION

With the adoption of immersive technologies, police departments can equip their officers with the skills and knowledge necessary to foster safer communities. Police chiefs and academy instructors see immersive technologies as a way to standardize high-quality training across their force. The technologies help ensure no officer is "learning on the street" for the first time during a crisis. They are enhancing training programs by making them more immersive, frequent, and scenario-rich than ever before. They are on their way to becoming a major asset in police training due to their flexibility, scalability, and immersiveness.

Virtual reality and augmented reality technologies are now being incorporated into simulator training and may one day replace lectures in classrooms, in-service and roll-call reminders, and force-on-force scenarios. As immersive technologies continue to evolve, they are poised to redefine the future of law enforcement training, moving towards developing officers who are not just trained but measurably skilled. The future of policing may lie in the three-dimensional world of a virtual reality headset. More

information about immersive technologies in law enforcement can be found in the books in [27,28].

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Figure 1 A police officer [1].

Figure 2 A representation of immersive technology [3].

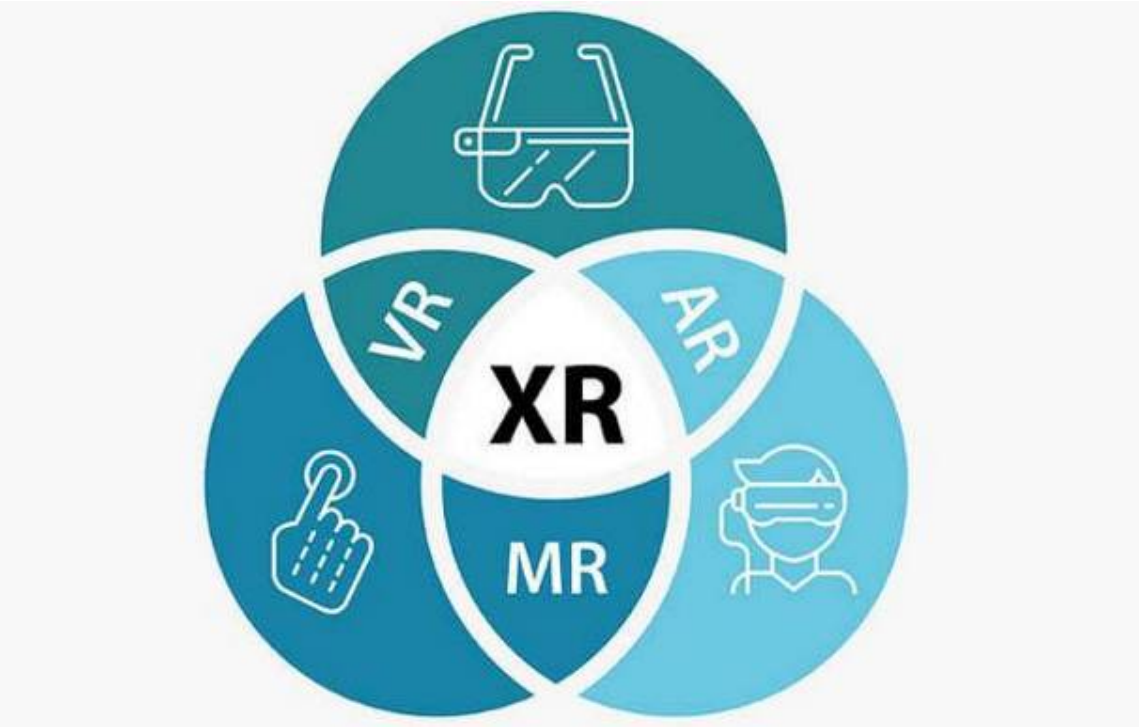

Figure 3 Extended reality (XR) includes AR, MR, and VR [6].

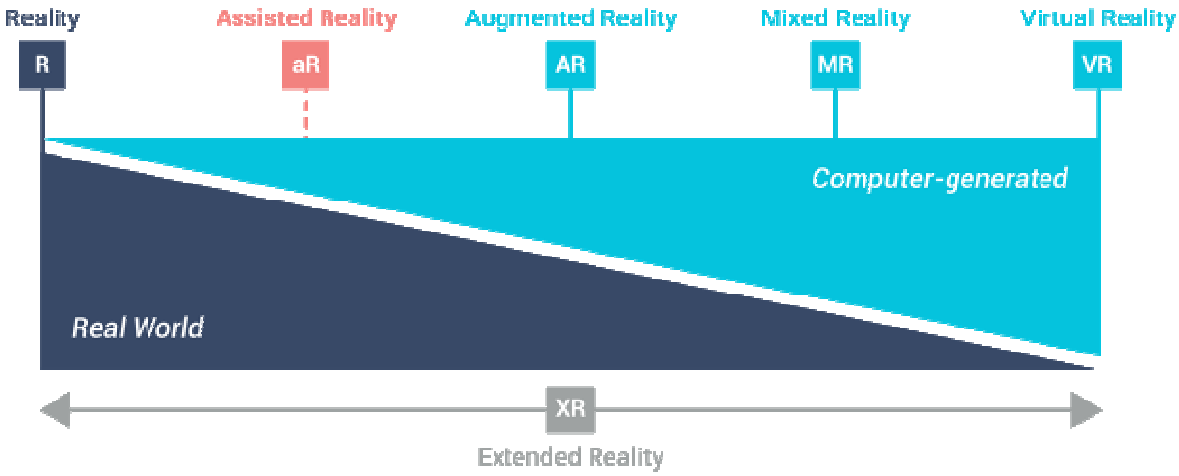

Figure 4 The XR spectrum [7].

Figure 5 Head-mounted displays [9].

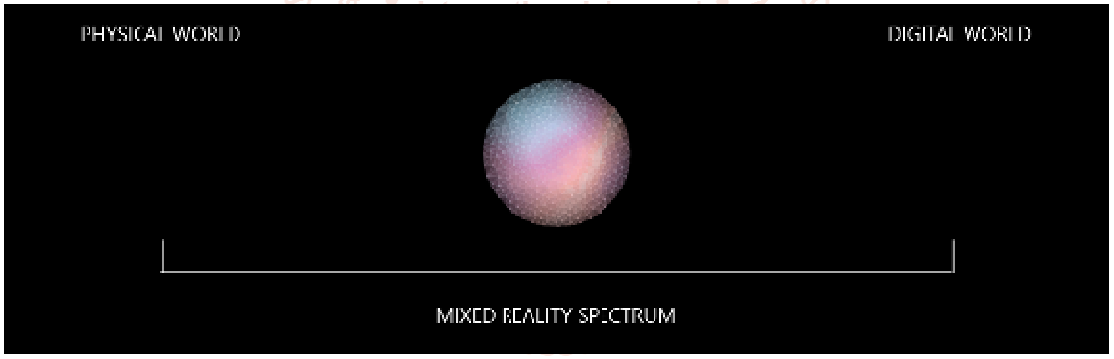

Figure 6 Mixed reality is a blend of physical and digital worlds [11].

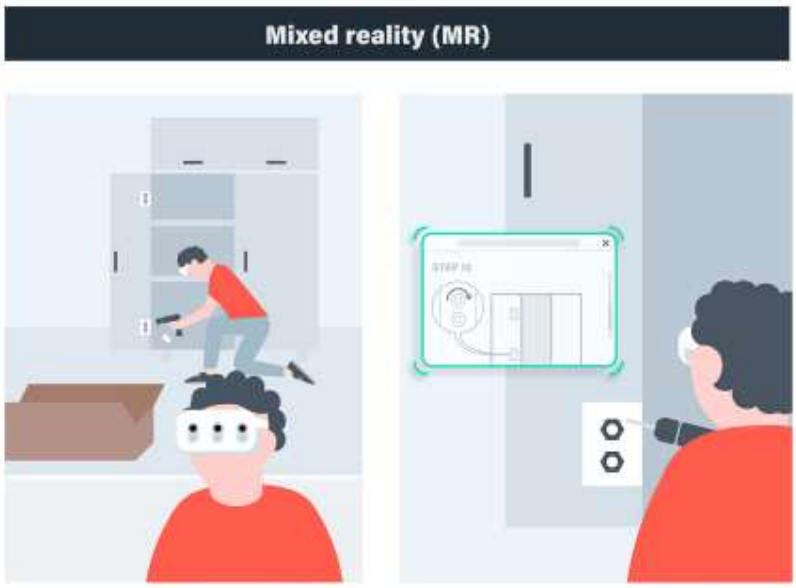

Figure 7 Mixed reality [12].

Figure 8 A worker wearing an assisted reality device [14].

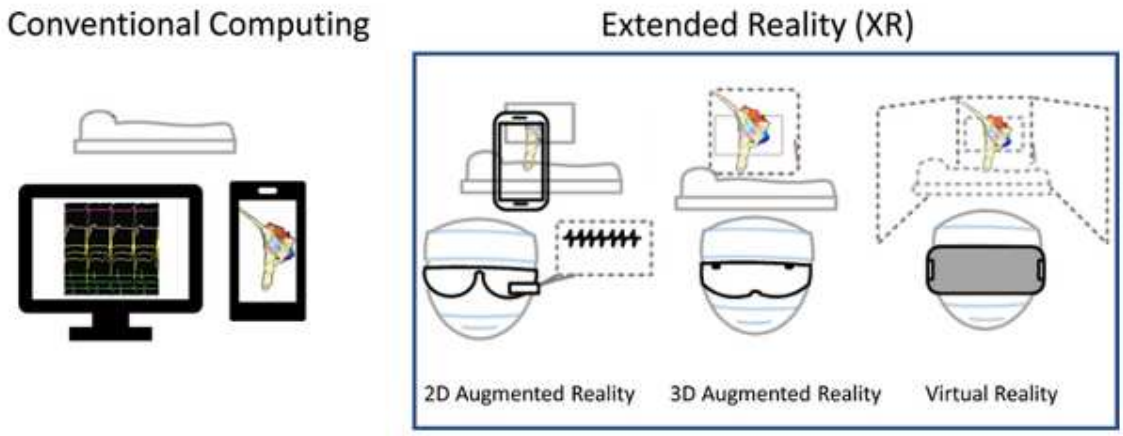

Figure 9 Comparing conventional computing with extended reality [15].

Figure 10 Atypical example of traditional police training [16].

Figure 11 Virtual reality police training [17].

Figure 12 A typical crime scene [22].