CHAPTER 7
VIRTUAL TUTORIAL APPLICATION

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7.1 INTRODUCTION

The rise of coffee shops in Malaysia has not only provided numerous job opportunities but also fuelled the interest of coffee lovers in brewing their coffee beverages. Beginners in the realm of coffee-making however, such as trainee baristas are bound to make mistakes, resulting in wasted coffee drinks, particularly in coffee shops where failed attempts cannot be served to customers. This leads to the wastage of vital resources such as water, milk, and coffee beans. Moreover, baristas who work in coffee shops with commercial espresso machines must have a high level of competence, training, and ability to adjust to the subtleties of each batch of coffee.

To help trainee baristas or even ordinary coffee-loving people improve their coffee-making skills while minimising resource wastage, a Virtual Barista Tutorial application with a Leap Motion Controller was developed. By simulating the hand gestures involved in the coffee-making process, users can practice and refine their skills in an engaging manner that goes beyond mere cognitive memorisation, as it actively involves the user's physical movements, enhancing their understanding and retention of the coffee-making steps.

While there are several games or applications on coffee making tutorials or coffee shop simulations, there is no existing barista tutorial application that uses leap motion as the input and control method. Existing applications available for Android or iOS platforms such as Latte Master (Acmelink, 2020), coffee.cup.guru (Sefcovic, 2023), Latte Art:Home Learning (Techno Horse, 2022), Barista Life (Zynga, 2022) and Barista Simulator (CubeCube Sports Ltd., 2023) either use a touch screen as the input method or a mouse and a keyboard. Therefore, they are not able to reproduce the exact true steps and the physical hand movements of making coffee. The use of Leap Motion technology enables the precise recognition of hand gestures and movements that can be applied to the art of coffee making.

7.2 TRADITIONAL BARISTA TRAINING

Traditional barista training typically involves a combination of theoretical instruction, hands-on practice, and mentorship under experienced baristas. Trainees begin by learning the theoretical aspects of coffee, including the history of coffee, coffee bean varieties, coffee-growing regions, and the coffee-making process. They may also learn about the equipment used in coffee making, such as espresso machines, grinders, and steam wands, as well as the various coffee beverages they will be preparing.

Once they have a basic understanding of coffee theory, trainees move on to hands-on practice with coffee-making equipment. They learn how to grind coffee beans to the correct consistency, properly dose and distribute coffee grounds into the portafilter, and tamp the grounds evenly to ensure proper extraction. Trainees practice pulling shots of espresso and adjusting grind size, shot volume, and extraction time to achieve the desired flavour profile. Throughout the training process, trainees work closely with experienced baristas who provide mentorship, guidance, and feedback. Mentors observe trainees as they practice and provide constructive criticism to help them improve their skills. Trainees may also have opportunities to shadow experienced baristas during busy

shifts to gain real-world experience in a cafe setting. Once trainees have demonstrated proficiency in coffee making, they may undergo a certification process to become certified baristas.

Several potential problems could be addressed in the development of a virtual barista training application. Traditional barista training relies heavily on hands-on experience, which can be challenging to replicate in a virtual environment. The problem encountered on how to effectively simulate hands-on practice with coffee-making equipment and techniques in a virtual setting. Coffee making involves a series of complex steps and techniques, from espresso extraction to milk texturing and latte art. The lack of how to break down these processes into manageable modules and effectively teach them in a virtual environment. Access to coffee-making equipment and resources may be limited for some trainees, particularly those in remote areas or with limited budgets. As the demand for barista training grows, the virtual training application must be scalable to accommodate a large number of users simultaneously. The problem arises on how to design a scalable platform that can be customised to meet the needs of different users, from beginners to experienced baristas.

Improvements could be made using extended reality (XR). XR technologies provide a highly immersive learning environment, allowing trainees to feel like they are physically present in a cafe setting. This immersion can enhance the learning experience by making it more engaging and memorable. XR enables interactive learning experiences where trainees can actively engage with virtual coffee-making equipment and practice techniques in a simulated environment. This hands-on approach promotes experiential learning and skill development.

The XR training applications can provide real-time feedback on trainees' performance, allowing them to receive immediate guidance and corrections as they practice. This feedback can help trainees improve their skills more quickly and effectively. XR training applications can be easily scaled to accommodate a large number of trainees simultaneously, making them ideal for businesses or