Universiti Teknologi MARA

EyeTry: AR Eyewear Virtual Try-On System

Muhammad Hafiz Bin Ramli

Thesis submitted in fulfilment of the requirements
for Bachelor of Information Technology (Hons.)
Faculty of Computer and Mathematical Sciences

July 2025

ACKNOWLEDGEMENT

Alhamdulillah, with great thanks to Allah for His endless blessings, I am happy to have finished this research on time. I want to thank my supervisor, Miss Siti Hasrinafasya Che Hassan, for his valuable guidance, constant support, and helpful feedback throughout the development of EyeTry: AR Eyewear Virtual Try-On System.

Special thanks to Dr. Muhammad Firdaus Bin Mustapha for his mentorship and valuable insights, which have greatly helped in the success of this project. I also want to thank my friends and classmates from CS240. Your friendship, shared experiences, and teamwork have made this academic journey more enjoyable and rewarding.

I am grateful, for all the support and influence I've received from those around me during my journey. Your encouragement and assistance have played a role in shaping the results of this research. I feel fortunate to have individuals, in my life. Thank you for being a part of this phase of my personal development. Your backing has been invaluable. I truly appreciate it.

ABSTRACT

Online eyewear shopping presents significant challenges, primarily due to the inability of users to physically try on eyeglasses, resulting in uncertainty, low customer confidence, and high return rates. To address these issues, this project proposes the development of an Augmented Reality (AR)-powered Virtual Try-On system that enables users to visualize eyewear in real-time, enhancing their shopping experience. Leveraging advanced AR technologies, including face tracking, 3D modelling, and AI-driven recommendations, the system provides personalized solutions tailored to individual preferences. The project adopts Agile methodology, emphasizing iterative development and user feedback to refine the application and meet user needs effectively. This solution aims to reduce product returns, boost user confidence, and enhance brand loyalty, offering a seamless and engaging alternative to traditional online eyewear shopping. By integrating AR with user-friendly design and robust database management, this innovative system represents a significant advancement in e-commerce, bridging the gap between online and in-store shopping experiences. The effectiveness of the EyeTry application was evaluated using the System Usability Scale (SUS) method. The results showed overwhelmingly positive feedback from users: 100% found the app easy to use and navigate, 98% expressed interest in continued use, and the majority disagreed with statements about the app being complex or inconsistent. These findings reflect the system's strong usability, intuitive design, and high user satisfaction.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

This section presents the foundation of the study, encompassing information on the significance of the research, problem statements, research objectives, and the scope of the research. It delves into the issues and challenges that have prompted the need for this research.

1.0 Background

The advances in technology have revolutionized the retail platforms allowing consumers the comfort of shopping from the comfort of their homes, however, eyewear shopping online still comes with its hurdles. The first challenge is the lack of ability to put on a pair of glasses to feel how they look or feel on an individual and dissatisfaction with the kind of frames chosen. Customers fail to have a clear view of how eyewear would be fitting them and in turn, confidence in the purchase, and in the end, high returns on the product. Kovács and Keresztes (2024) explain that friction appears in other product categories as well in the context of online shopping because it is complicated for consumers to envision how products will sit on them in terms of appearance and accommodating fit. To overcome these difficulties, concepts of the augmented reality virtual try-on systems for eyeglasses have been developed as user-friendly tools to allow the customers to try any item of clothing on the online store with the help of a camera.

AR technology places virtual images on a physical surface then the consumers can interact with those products. Using facial recognition and 3D modelling in the case of Augmented Reality, virtual try-on of glasses enables one to demonstrate how different frames would look like on the face of the user. Ho et al., (2023) reveal that AR applications make the user engaged and happy because they give a closer and richer idea of what is being sold. By allowing users to test different frames on a virtual