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Department of Computer Science and Engineering

MINI PROJECT

On

Mobile Application Development

Trends-AR(AR E-commerce app)

Course Code: 20CSE42

Academic Year – 2022-2023

Semester: 6 Section: B &C

Submitted To,

Course Instructor:Ms Ankitha A Nayak
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Dept. of Computer Science and Engineering
NMAMIT, Nitte

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Date of submission: 8-05-2023

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CERTIFICATE

"Trends-AR App" is a bonafide work carried out by Prathiksha Kini(4NM20CS139), Sammitha S Poojary(4NM20CS151) and Keerthana(4NM20CS094) in partial fulfillment of the requirements for the award of Bachelor of Engineering Degree in Computer Science and Engineering prescribed by Visvesvaraya Technological University, Belagavi during the year 2022-2023.

It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report. The Mini project report has been approved as it satisfies the academic requirements in respect of the project work prescribed for the Bachelor of Engineering Degree.

Signature of Guide Signature of HOD

ABSTRACT

Trends-AR is an Android AR E-commerce app for clothes that allows users to view 3D models of products in AR. The app uses ARCore for AR functionality and Sceneform for rendering 3D models. The AR activity retrieves the product name from the previous activity and uses a hashmap to store the 3D model and scaling information for each product. When the user taps on a detected plane, the app places the selected product's 3D model on the plane and allows the user to transform and scale the model. The app checks whether the device supports ARCore and OpenGL version 3.0 or higher before starting the AR functionality.

The 3D model is rendered using a ModelRenderable object that is built using a GLB file. Once the model is built, an Anchor object is created to anchor the model to the detected surface. An AnchorNode is then created with the anchor, and a TransformableNode is attached to the AnchorNode to allow the user to manipulate the position, scale, and rotation of the 3D model using touch gestures.

Overall, the Trends-AR app provides an immersive and interactive way for users to visualize and experience products in the real world using AR technology.

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Introduction

Augmented reality (AR) models are digital representations of objects, products, or environments that can be overlaid onto the real world using AR technology. These models can be created using 3D modeling software, scanned using 3D scanners, or captured using photogrammetry techniques.

AR models can be used in a variety of applications, including e-commerce, entertainment, education, and training. In e-commerce, AR models can be used to enable customers to see how products would look in their homes or workplaces before making a purchase. In entertainment, AR models can be used to create immersive gaming experiences or interactive exhibits. In education and training, AR models can be used to simulate real-world scenarios and provide learners with hands-on experience.

To display AR models in the real world, AR applications use computer vision algorithms to detect surfaces and track the position and orientation of the device's camera. Once a suitable surface has been detected, the AR model is rendered in real-time, appearing to be part of the real world. Users can interact with AR models using touch gestures, allowing them to manipulate the model's position, rotation, and scale.

Overall, AR models are a powerful tool for creating immersive and interactive experiences, enabling users to engage with digital content in new and exciting ways.

Problem Statement

The problem statement for this AR e-commerce app project is to provide an immersive and interactive shopping experience to the users. Traditional e-commerce platforms offer limited product visualization, which makes it difficult for customers to make an informed purchase decision. With the implementation of Augmented Reality (AR), customers can view 3D models of the products in real-time and make informed decisions about their purchases.

The AR e-commerce app aims to solve the following problems:

1. Limited product visualization: Traditional e-commerce platforms offer limited product visualization, which can result in a higher number of returns and unsatisfied customers.
2. Inconvenient size and fit: Online shopping makes it difficult for customers to determine the perfect size and fit for their desired product. This leads to a higher number of returns and unsatisfied customers.
3. Lack of interactivity: Traditional e-commerce platforms lack interactivity, which can lead to a monotonous shopping experience.

The AR e-commerce app will solve the above problems by providing customers with an immersive shopping experience that allows them to visualize the products in 3D and assess their size and fit. It will also offer interactivity by allowing customers to interact with the 3D models and customize their desired products.

Objectives

- To design a user-friendly and intuitive interface that enables customers to easily navigate through the app and make purchases.
- To create a comprehensive and updated product catalogue that includes product descriptions, images, and pricing.
- To incorporate an effective search function that enables customers to find products quickly and easily.
- To create a customer management system that enables customers to create accounts, manage their profiles, and track their orders.
- To ensure that the app is secure, and that customer data is protected at all times.
- To ensure that the app is responsive and fast, even during periods of high traffic.

Hardware and Software Requirements

Hardware Requirements:

Processor: A multi-core processor such as Intel Core i5 or i7 or equivalent

RAM: A minimum of 8 GB of RAM is recommended

Storage: A minimum of 20 GB of free disk space is recommended

Android smartphone or tablet with minimum Android version 7.0 (Nougat) or later

Software Requirements:

Android Studio: version 4.0 or later

ARCore: Google's AR platform for Android devices

Sceneform: 3D framework for building AR experiences on Android

Firebase: Backend-as-a-Service platform by Google, for hosting product information and user data

Methodology

The methodology for developing the AR E-commerce app can be divided into several stages, including:

1. **Requirement gathering**: The first stage is to gather requirements from the client or stakeholders to understand the project's objectives, scope, and features.
2. **Design and Planning**: In this stage, the application architecture, wireframes, and UI/UX design will be developed. The team will also create a project plan and a list of milestones to achieve.
3. **Development**: This stage involves coding the application based on the design and planning phase. The development will be done using Android Studio, ARCore, and Sceneform. The team will also integrate Firebase for the backend and database.
4. **Testing**: In this stage, the team will test the application to ensure that it is working as per the requirements. The testing will include functional, performance, and security testing.
5. **Maintenance**: The team will provide regular maintenance and support to fix bugs and add new features based on user feedback.

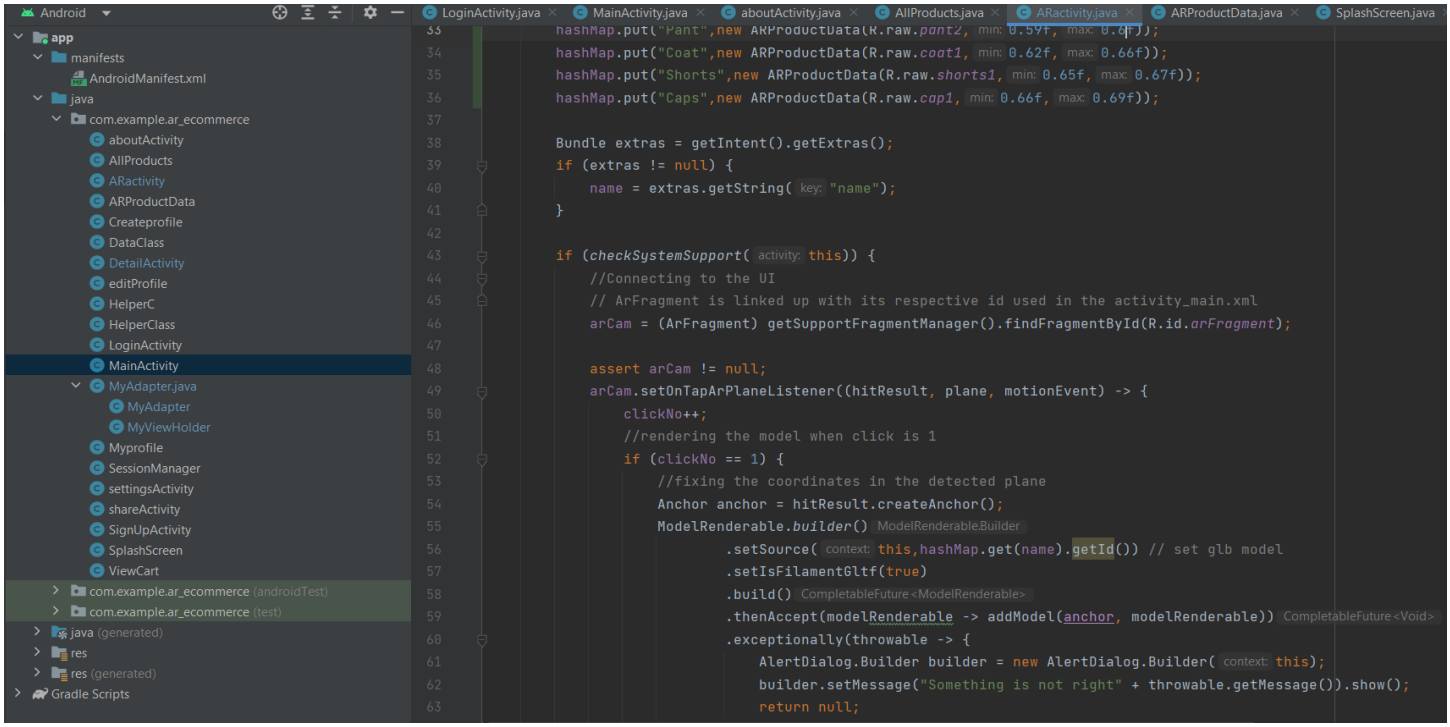
The Agile methodology will be used throughout the development process to ensure that the project is delivered on time and within budget. The team will use Scrum framework for managing the project, which involves sprint planning, daily stand-ups, sprint reviews, and retrospectives.

Implementation

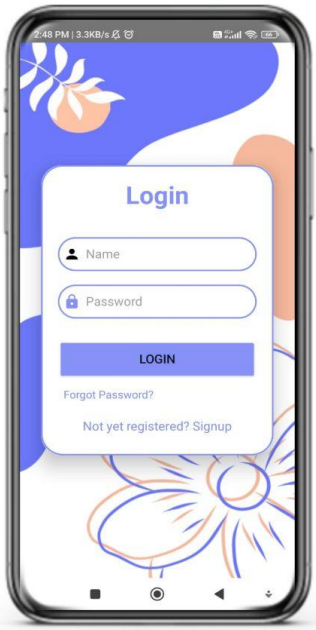
The Android Studio Trends-AR App was developed using Java programming language and the Android Studio IDE. The app utilized a Firebase database to store user profiles and preferences. The user interface was designed and various Android libraries and frameworks were employed using XML layouts, to achieve specific functionalities.

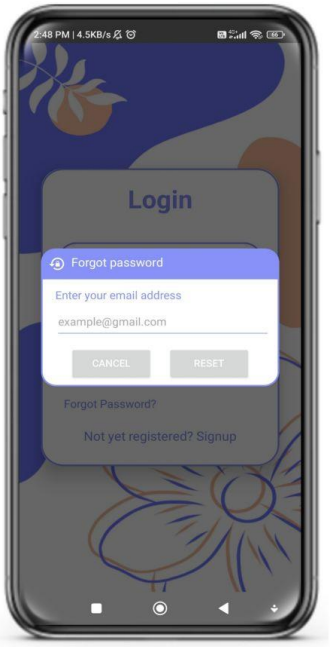
- Store products in cartFeatures
- Login/SignUp
- Create profile
- 3D product visualization

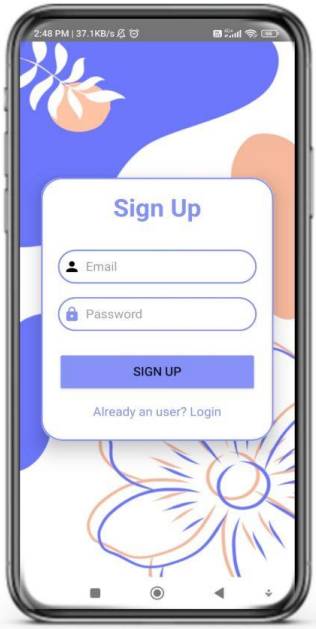
Integration with AR

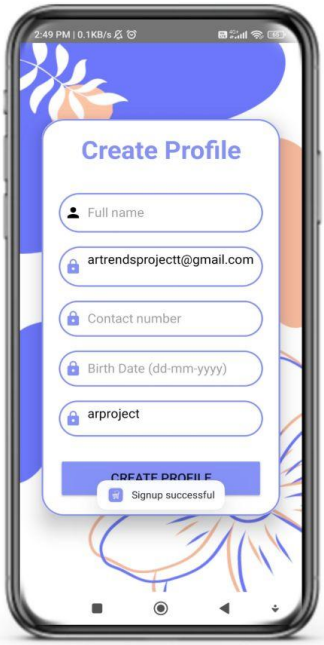


USER INTERFACE Snapshots





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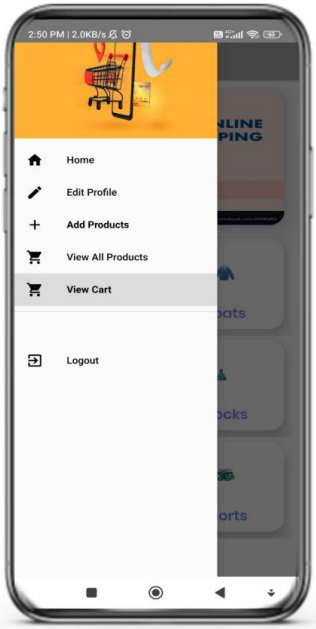
Signup successful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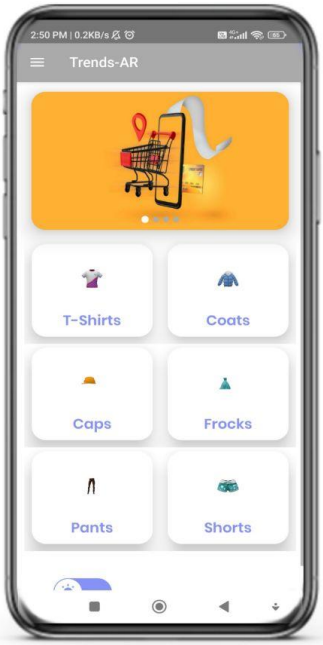
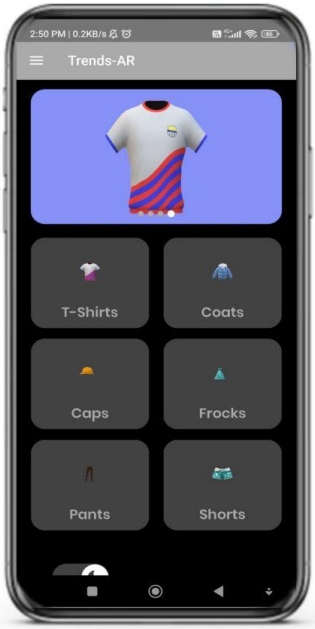
Edit Profile
Add Products
View All Products
View Cart
Logout


Trends-AR
T-Shirts
Coats
Caps
Frocks
Pants
Shorts


Trends-AR
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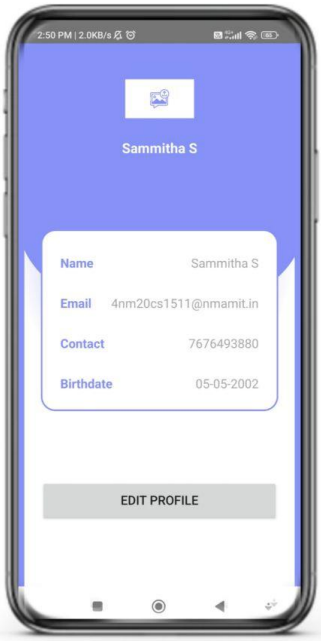
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Email
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Contact
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Birthdate
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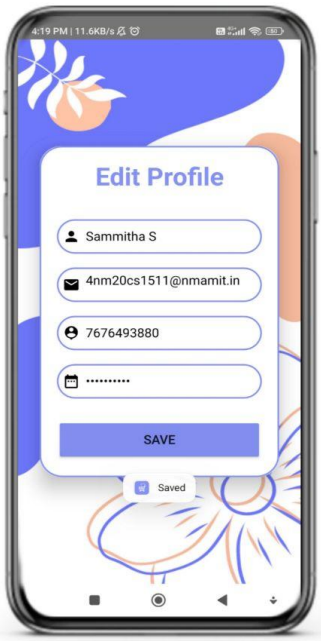
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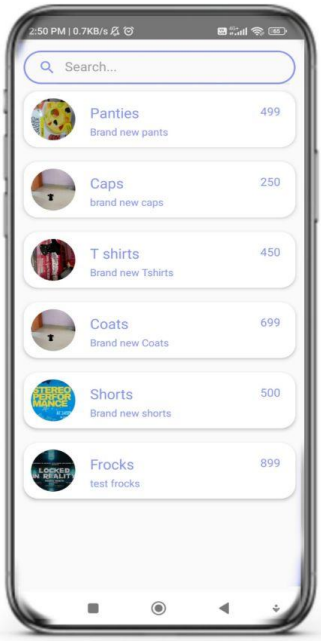
SAVE
Saved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Panties
Brand new pants
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Caps
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T shirts
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Coats
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Shorts
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Frocks
test frocks
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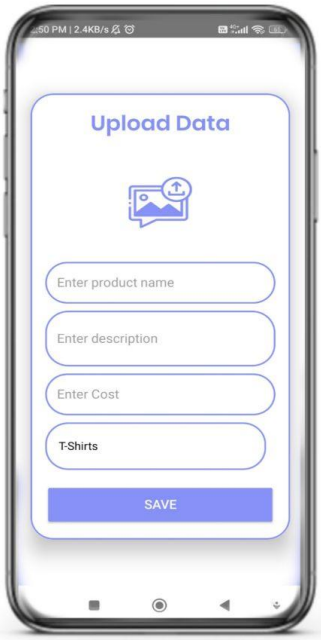
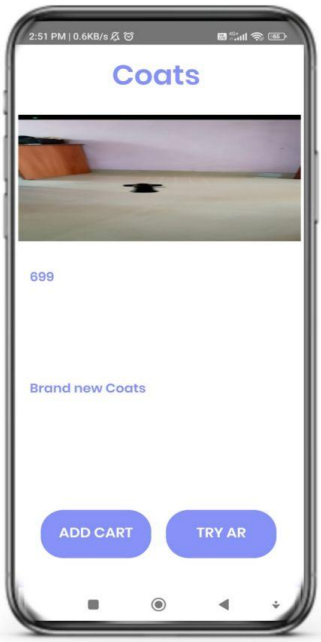

Upload Data
Enter product name
Enter description
Enter Cost
T-Shirts
SAVE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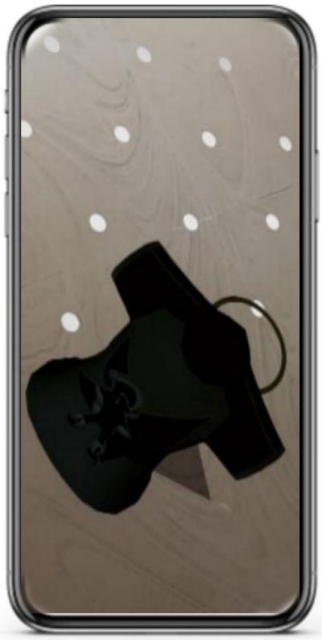
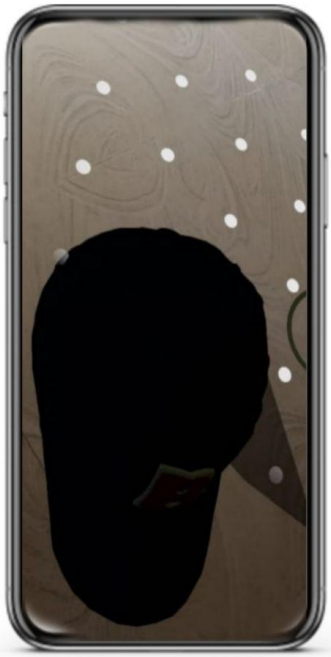
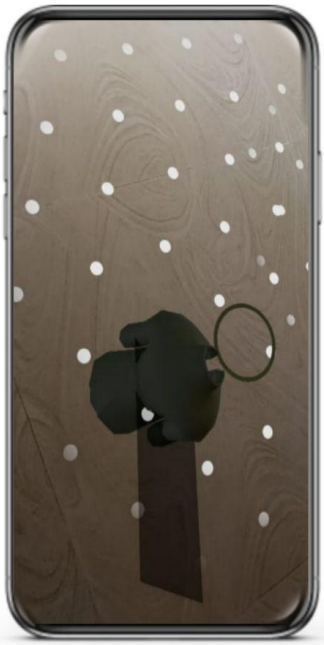
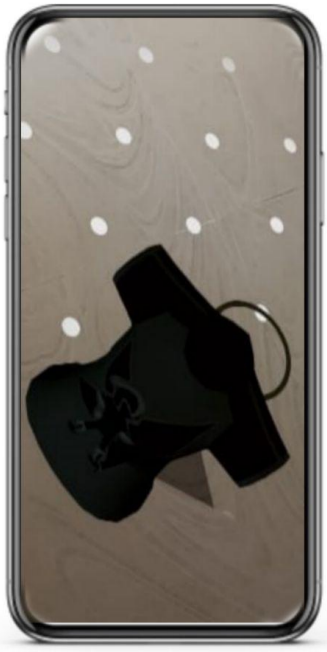
Coats
699
Brand new Coats
ADD CART
TRY AR



Results







Conclusion & Future Scope

In conclusion, the AR e-commerce app project has successfully demonstrated the use of augmented reality in transforming the traditional e-commerce industry by providing a more immersive and interactive shopping experience. The project has successfully implemented the use of advanced technologies, such as ARCore, Sceneform, and Filament, to develop and render realistic 3D models of products, enabling customers to visualize and try on products before making a purchase decision.

The project has achieved its primary goal of developing an intuitive and user-friendly app that provides customers with a seamless AR shopping experience. Additionally, the use of hashmap to store product data allows for the dynamic rendering of appropriate models based on user selection.

In terms of future scope, the AR e-commerce app project can be further enhanced by incorporating additional features such as social media integration, personalized product recommendations, and gamification elements to increase user engagement. The app can also be expanded to include a wider range of products, such as furniture, home decor, and automobiles, to cater to a larger customer base.

Furthermore, with the increasing popularity of augmented reality, the AR e-commerce app project can serve as a blueprint for other e-commerce businesses looking to incorporate AR technology into their platforms. Overall, the AR e-commerce app project has set a new benchmark for the e-commerce industry and represents a significant step forward in the adoption of augmented reality in the retail sector.

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