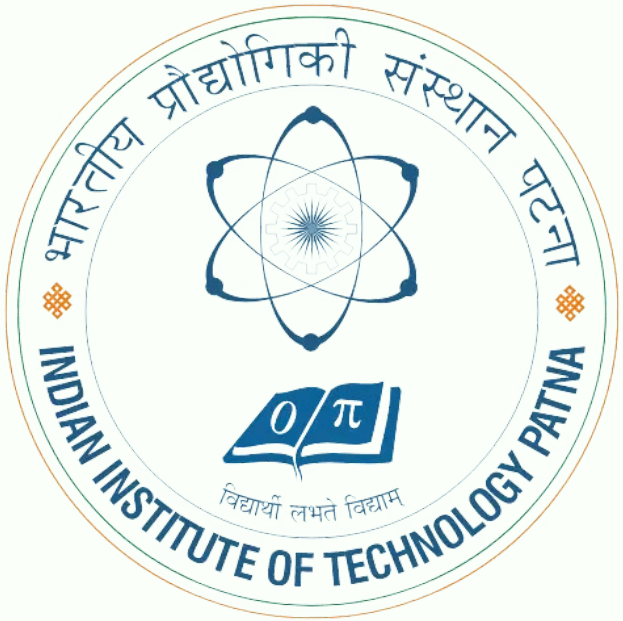

MTech Sem 3 Project Report Presentation

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Augmented Reality for Personalised Custom-Fit Clothing in E-Commerce

1

Problem in Clothing Industry

Difficulty finding the right fit and size for clothing purchases

2

AR Use Case

Augmented reality can transform the shopping experience by allowing customers to virtually try on clothes

3

Fashion-Fit App

Customizes clothing sizes for users to solve the fit problem

Problem in clothing industry

The clothing industry is currently grappling with significant challenges related to **garment fit** and **high return rates**. These issues not only impact customer satisfaction but also incur substantial financial and environmental costs, as research articles suggests -

Key problems include:

- **SizeFlags: Reducing Size and Fit Related Returns in Fashion E-Commerce**
  This research paper discusses high return rates (up to 40% overall, and even 75% for some categories) in online fashion due to size and fit issues, exploring technological solutions to mitigate these challenges. **Read the article (arXiv, PDF)**
- **Improving Returns Management for Apparel Companies (McKinsey)**
  This industry report explores the scale of returns in apparel, costs associated, and strategies for reducing returns, with a focus on sizing and fit issues. **Read the article (McKinsey)**
- **The billion-pound question in fashion E-commerce (ScienceDirect)**
  This journal article analyzes the impact of e-commerce on the fashion industry, including how online shopping has exacerbated issues of fit, returns, and customer dissatisfaction. **Read the article (ScienceDirect)**
- **A STUDY ON RETURNS RATES IN THE FASHION INDUSTRY WITH REFERENCE ... - JETIR**
  This study examines the causes of high return rates in the fashion industry, including size and fit difficulties, and suggests methods for retailers to lower these rates. **Read the article (JETIR, PDF)**
- **10 Challenges Facing The Fashion Industry In 2025 - Heuritech**
  This article highlights persistent e-commerce return rates in fashion, largely due to fit issues, and discusses the broader challenges the industry faces, including environmental and customer experience impacts. **Read the article (Heuritech)**

AR Applications: Virtual Try-On

Virtual Try-On

Customers can virtually "try on" clothes. They use their smartphone cameras. This boosts conversion rates by 30%.

Reduced Returns

Incorrect sizing causes fewer returns. An estimated 25% reduction is possible. The Wanna Kicks app is a good example.

Virtual try-on enhances the online shopping experience. It provides a realistic preview of garments. This technology benefits both consumers and retailers.

AR Fashion Shows: Immersive Digital Runways

Expanded Reach

AR-powered virtual fashion shows transport audiences to digital runways, allowing attendees to explore collections from anywhere.

Cost Savings

Virtual shows reduce traditional event costs by up to 50%. Brands can showcase digital-only garments, boosting engagement.

Unleashed Creativity

AR blends fashion and technology, empowering designers to push creative boundaries. Virtual runways unlock new possibilities.

AR is redefining the fashion show experience, making it more accessible, cost-effective, and creatively boundless. The future of the runway is digital and immersive.

AR Applications: Personalized Style Recommendations

AI-Powered Suggestions

AI recommends styles. It uses body measurements and preferences. This boosts customer satisfaction by 35%.

Enhanced Loyalty

Personalized experiences build loyalty. Customers feel understood. Zeekit, acquired by Walmart, is a leading example.

AR helps shoppers find ideal outfits. It creates a highly tailored shopping journey. This leads to happier, more loyal customers.

Core AR Algorithm: Image Recognition and Tracking

1

Feature Extraction

Key points are identified in images. Corners and edges are crucial. This forms the basis for tracking.

2

Tracking Algorithms

Clothing position is detected in real-time. It maintains stability. OpenCV and ARKit/ARCore are widely used tools.

These algorithms ensure clothing overlays are stable. They adapt to user movement. This creates a seamless virtual try-on experience.

Core AR Algorithm: 3D Modeling and Rendering

3D Model Creation

Accurate 3D models are made from 2D images. This captures garment shape precisely. It's vital for realistic fit.

Texture Mapping

Fabric textures are applied to models. This adds realism. Material properties are accurately replicated.

Rendering Engines

Unity or Unreal Engine render models. They integrate into AR environments. This brings virtual clothing to life.

Realistic rendering is crucial for user acceptance. These steps ensure virtual garments look and move naturally. This enhances the overall AR experience.

Fashion-Fit App: Problem Statement

High Return Rates

Incorrect sizing leads to 20-40% returns, causing significant costs for retailers.

Lack of Personalization

Customers experience generic shopping journeys, impacting satisfaction and loyalty.

Limited Fit Visualization

Shoppers struggle to accurately visualize how clothes will look and fit their individual body types before purchase.

These challenges lead to customer dissatisfaction. They also result in significant costs for retailers. A new solution is urgently needed.

Fashion-Fit App: AR-Powered Solution

Body Scan & Avatar

User scans their body via smartphone camera. The app generates a precise 3D avatar. Measurements are highly accurate.

Virtual Try-On

Clothes are overlaid onto the avatar. This happens in real-time. Users see realistic fit and drape.

AI Style Advice

AI suggests clothing based on preferences. It considers body type. This provides personalized recommendations.

This AR solution offers a tailored shopping experience. It addresses fit concerns directly. Customers gain confidence in their purchases.

Fashion-Fit App: Key Features

3D Body Scanning

Uses iPhone's TrueDepth camera. Achieves 2mm accuracy. Provides precise body measurements.

Realistic Cloth Simulation

Accounts for fabric properties. Considers weight and stretch. Ensures natural garment drape.

Social Sharing

Users share virtual outfits. Friends give feedback. Enhances the shopping experience.

E-commerce Integration

Seamless purchasing process. Links directly to retail sites. Simplifies the buying journey.

These features create a comprehensive virtual fitting room. The app combines precision with user-friendly functionalities. It elevates online clothes shopping.

Competitor Analysis:

App Name	AR / Virtual Try-On	Fit Recommendation Feature	Key Fitting Issues	Remarks / Gaps
Myntra	❌ No	✅ Size & fit recommendation engine	Inaccurate for different brands; No body visualization	High returns due to wrong fit; lacks body scanning
Ajio	❌ No	✅ Basic size guide	No personalization; No body visualization	High returns due to wrong fit; lacks body scanning
Amazon Fashion	⚠️ Limited (only for shoes/sunglasses)	✅ “Fit insights” from reviews	No dynamic fitting Model-based info not relatable	Still dependent on manual size selection
Flipkart Fashion	❌ No	✅ Size recommendation based on past orders	No body-type matching Cannot simulate fit or drape	UX doesn’t support personalized fashion
Tata CLiQ	❌ No	✅ Standard sizing charts	Poor user confidence High visual inaccuracy	Lacks investment in fashion UX

Conclusion: The Future of Fashion with AR

AR is transforming the clothing industry. It enhances customer experiences. It reduces costs and increases engagement.

Fashion-fit apps solve critical problems. They address sizing and fit issues directly. Future innovations include AI-driven style advice and interactive design tools.

AR is poised to revolutionize how we buy and interact with fashion. The possibilities are endless.