

*FashionViz*

# AI-Driven Fashion Recommendation Platform

November 2023



# 63%

63% of millennials in the United States are interested in using AR to customize clothing items

# 13.4%

The global AR in fashion market is projected to witness a CAGR of 13.4% during the forecast period 2021-2026

# 35.9 million

As of 2023, an estimated 65.9 million people in the United States have adopted augmented reality technology



# FashionViz

Fashion Retail with AI-Driven Recommendations  
and Immersive Shopping Experiences



## Who are our stakeholders?

Tech firms seeking innovation in  
fashion-tech integration

## What is the Business Problem?

Improving customer engagement and  
sales in E-commerce fashion by  
attracting new customers

## What we do?

FashionViz creates a highly immersive  
and personalized shopping experience  
using recommendation systems.



# Data Explanation

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## Data Source

Kaggle.com

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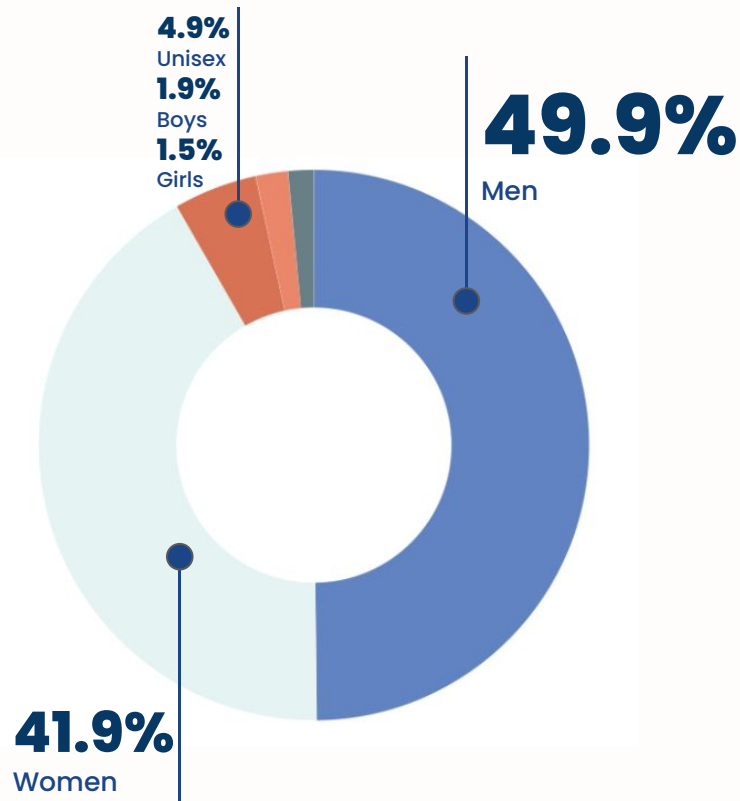
## Image Folder

Comprises more than 44.4k  
high-resolution images (2400x1600)  
of fashion products

# By exclusively targeting Men and Women in binary classification, we address data imbalance for enhanced model performance

## 1. Gender Classification

- The dataset is highly imbalanced in terms of gender representation
- The Men and Women categories dominate the dataset



# Gender Binary Classification Analysis

Best Cross-Validation  
Score: **0.758**

Baseline  
CNN model

Leaky ReLU  
activation

Best Cross-Validation  
Score: **0.818**

Best Cross-Validation  
Score: **0.973**

Swish  
activation

Best Cross-Validation  
Score: **0.982**

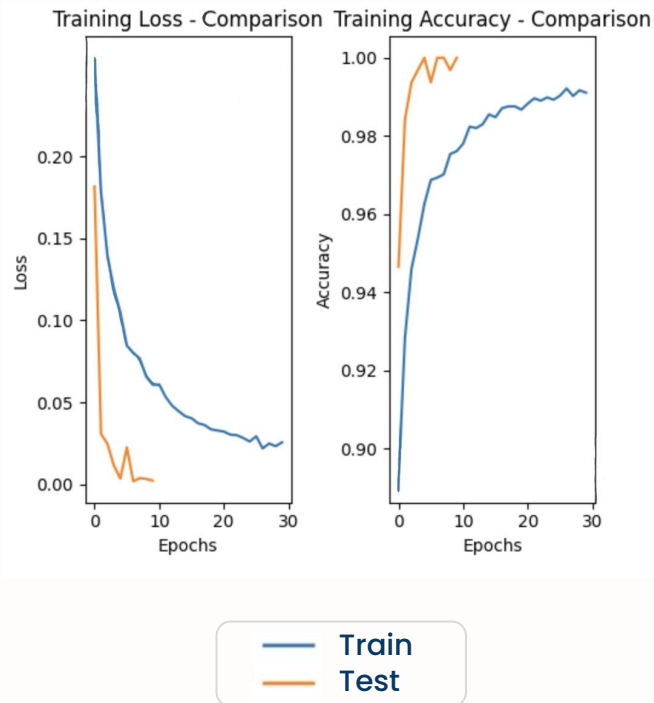
Best Cross-Validation  
Score: **0.991**

ResNet 50

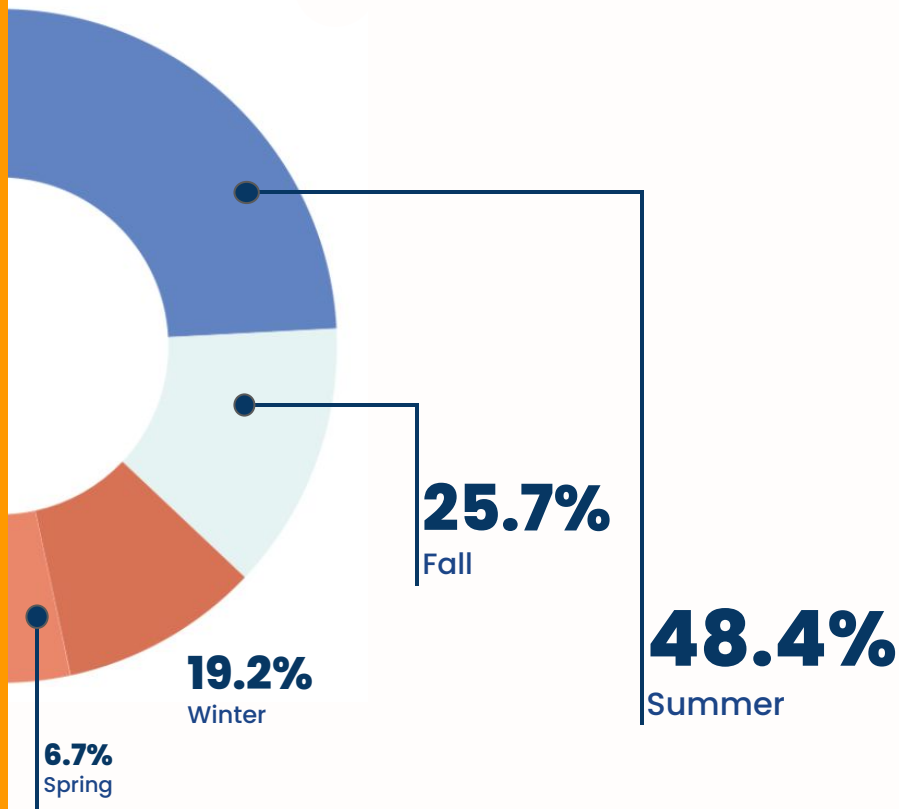
EfficientNet  
B3

# EfficientNet B3 Achieves 99.1% Cross-Validation Accuracy in Training and 99.9% in Test

- Fine-tuning played a crucial role in enhancing model performance
- The loss continues to decrease consistently across epochs reaching 0.0150
- The model learned the features effectively, fitting exceedingly well to the test dataset



# Seasonal categories showed a significant imbalance, posing a challenge for accurate model training

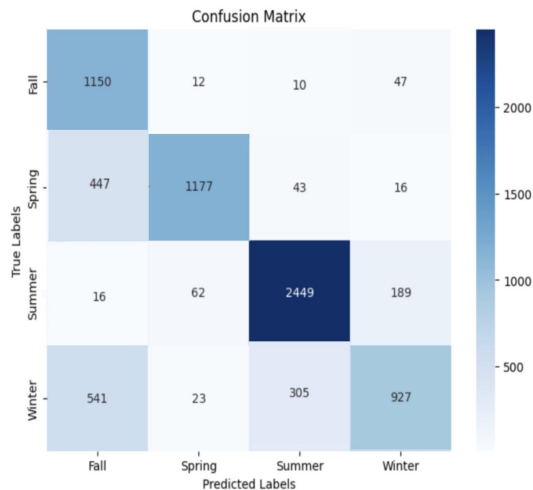
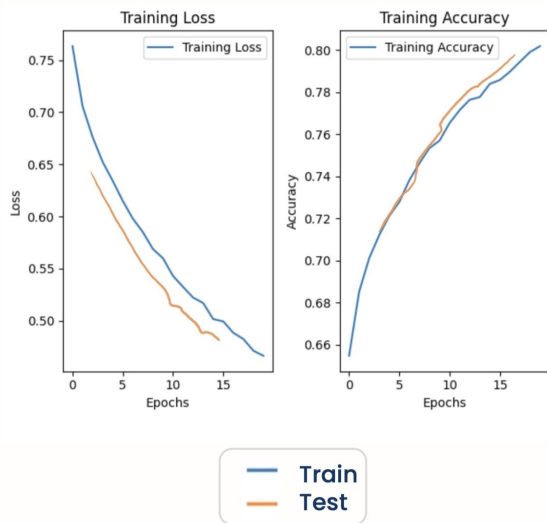


## 2. Seasonal Classification

- **ImageDataGenerator** was used to balance the dataset by applying diverse transformations, such as rotation, shifting, and flipping
- **Class weights** addressed data imbalance, ensuring fair learning for accurate fashion classification



# Enhanced EfficientNetB3 model achieved 80% accuracy on training and test sets.



**47.7%**

Baseline  
CNN model

**57.8%**

EfficientNetB3  
Baseline model

**54.5%**

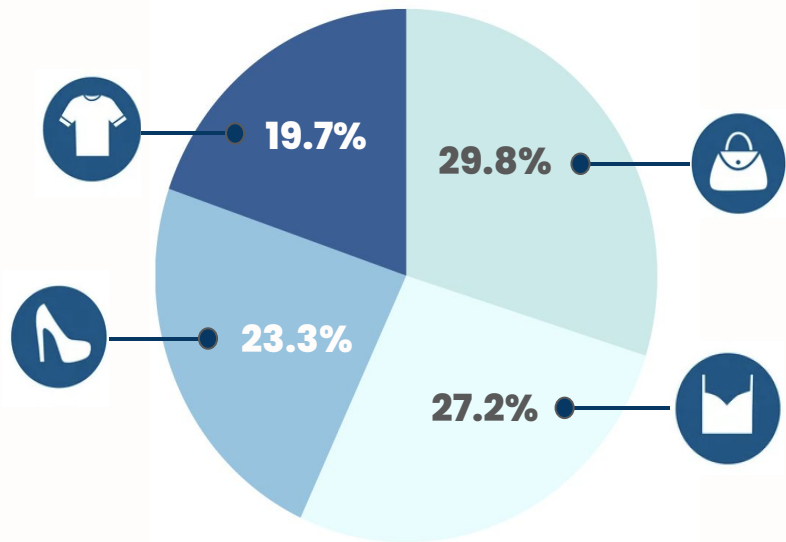
VGG16 model

**80.1%**

Deeper  
EfficientNetB3

- Despite a longer training duration, the model effectively minimizes loss without overfitting

# Unlike Seasonal categories, Multi-Class Women's Fashion Essentials boast a balanced distribution, optimizing accuracy in model training



## 3. Categorical Classification

- **Wunderlabel.com's** statistics highlight women's frequent purchases in Handbags, Tops, Heels, and Tshirts, leading us to prioritize these categories
- All four categories exhibit a **balanced distribution**, ideal for effective modeling and strategic decision-making

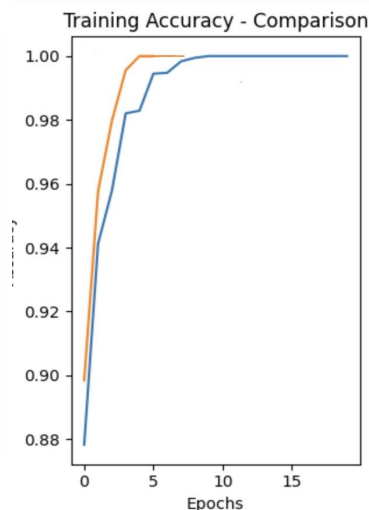
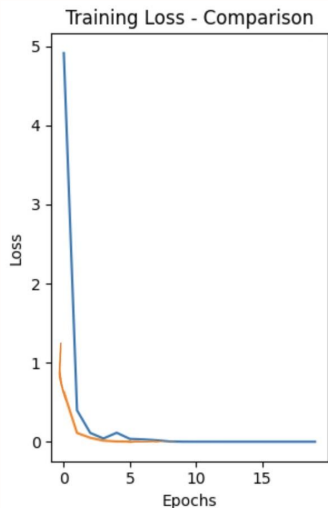
# The VGG16 model demonstrates great results both on the training and test sets, reaching close to 100% accuracy

**97.8%  
MobileNet**

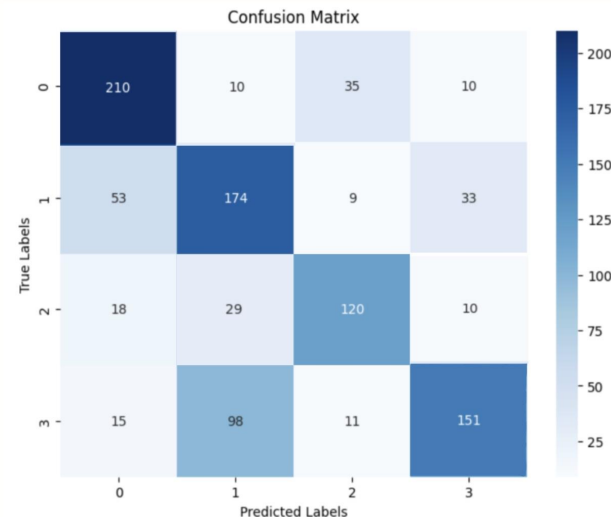
**98.6%  
Best CNN**

**99.6%  
ResNet50**

**99.9%  
VGG16**



— Train  
— Test



0. Shoes 1. Bags 2. Tops 3. T-Shirts

- Efficiently trained in just 8 minutes per epoch, this model showcases both speed and accuracy

# FashionViz

## Future Innovations in Fashion Industry



- Expand and diversify the dataset for improved model accuracy
- Create an AR fashion app for immersive virtual try-ons and tailored recommendations.
- Craft personalized fashion tools for tailored advice, boosting customer engagement
- Partner with fashion brands for interactive, personalized shopping

# FashionViz AI-Driven Fashion Recommendation Platform



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