Clothes Dataset

Image Classification Data from Carousell

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The Importance of Image Recognition in Fashion

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Data is the New Gold

- Data is one of the most valuable resources. (I know that from my personal experience)
- It helps make smarter, evidence-based decisions, Data turns information into action.
- This project explores unstructured data through image classification, aiming to understand and address key challenges in the fashion domain.

Image Classification for Fashion E-Commerce

- Dataset of fashion images from Carousell, an online marketplace.
- 15 clothing categories including jeans, blazers, skirts, and jackets.
- With variety like different colors, textures, styles, and lighting.
- The goal is to train a neural network to classify clothing types automatically.

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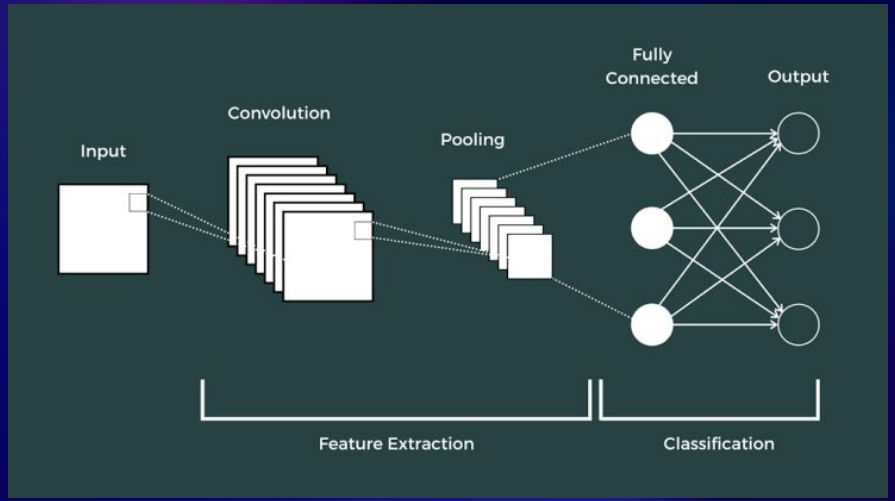
Why CNNs



CNNs

- Designed to handle high-dimensional image input efficiently.
- Use convolutional layers to detect local patterns.
- Apply pooling layers to reduce dimensionality and retain important features.
- Low-level to high-level features.
- Require fewer parameters than fully connected networks thanks to weight sharing.

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Experiments and Model Testing

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Trained multiple CNN architectures based on AlexNet:

- Original AlexNet
- Original AlexNet-style with 3 Conv2D layers per block
- Modified sequential models with BatchNormalization after each Conv2D
- Variations with MaxPooling2D(2,2) and strided convolutions replacing pooling
- Tested different input image sizes

Exploring Architectures & Training Strategies

- Used ImageDataGenerator with advanced augmentation (flip, rotate, zoom, shear, shift)
- Compiled all with Adam optimizer (lr=0.001), categorical crossentropy loss
- Applied callbacks: EarlyStopping (patience=5), ReduceLROnPlateau (factor=0.3, patience=3)
- Trained for up to 40 epochs with validation split (20%)

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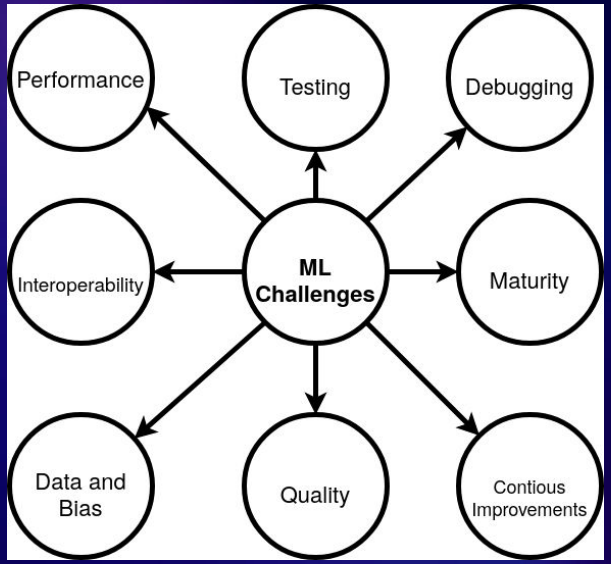
Challenges and Solutions



Managing Complexity

- Long training time on complex models
- Versioning issues
- Underfitting in early models
- Too many variables (hyperparameters)
- Overwhelming settings to tune

Results

	Key Points	Params	Kernel	Pooling Strategy	Training Accuracy	Prediction Accuracy
AlexNet	Classic and Heavier	60 M	11x11 to 3x3	Max Pooling 3x3	6 %	6 %
AlexNet 3Conv Block	Expensive and Deep	9 M	5x5	Max Pooling 2x2	68 %	58 %
Sequential 5 Block	Efficient and Reliable	2 M	3x3	Max Pooling 2x2	67 %	57 %
Sequential 6 Block	Aggressive and Complex	20 M	5x5	Max Pooling 2x2 and end with Max Pooling 1x1	85 %	60 %
Sequential 5 Block with strides	Compromise	14 M	3x3	Max Pooling 2×2 and Strided Convolutions	63 %	48 %

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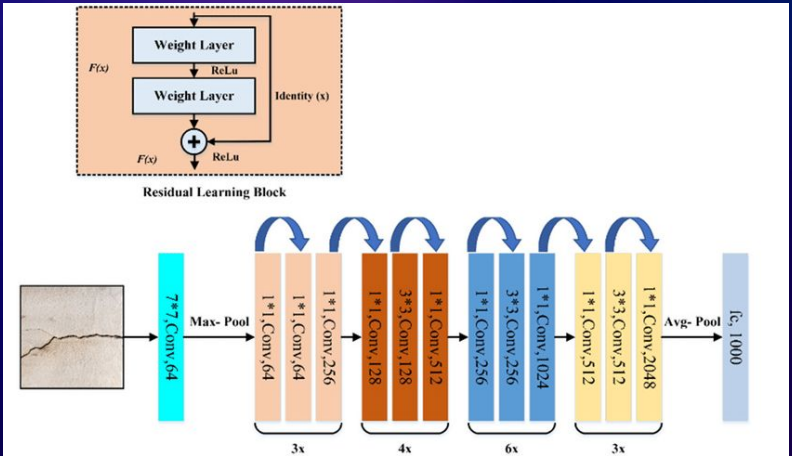
Conclusions and Future



Conclusions and Future

- Limited dataset and suboptimal data augmentation
- Restricted computational resources
- Potential improvements include:
  - Increasing the number of training epochs
  - Applying more effective data augmentation techniques
  - Enhancing batch normalization strategies
  - Experimenting with different learning rates
- A well-established solution exists: ResNet

Thanks!

Thank you for your attention, wishing you a pleasant day.