Algorithms

Intrusion Detection System		Facial Recognition		Object detection	
Algorithm	Description	Algorithm	Description	Algorithm	Description

SVM	Effective for binary classification of normal vs. malicious traffic.	Convolutional Neural Networks (CNNs)	AlexNet, VGGNet, ResNet, Inception, MobileNet.	SSD	• SSD predicts bounding boxes and class scores at multiple scales using a single CNN.
					• **Key Features**:
					  ○ Faster than Faster R-CNN.
					  ○ Good balance between speed and accuracy.

Random Forest	Ensemble of decision trees for improved accuracy.	Eigenfaces	Based on Principal Component Analysis (PCA) for dimensionality reduction.	Faster R-CNN	• **Description**: Faster R-CNN introduces a Region Proposal Network (RPN) to generate region proposals, making it faster and more accurate than its predecessors.
					• **Key Features**:
					  ○ End-to-end trainable.
					  ○ High accuracy with moderate speed.
					• **Use Case**: Research and real-world applications.
					Paper: Faster R-CNN Paper

CNN		Haar-Cascade	A feature-based method for real-time face detection.	DETR	• DETR uses a transformer architecture to predict object bounding boxes and class labels directly from the input image. • **Key Features**: ○ End-to-end trainable.

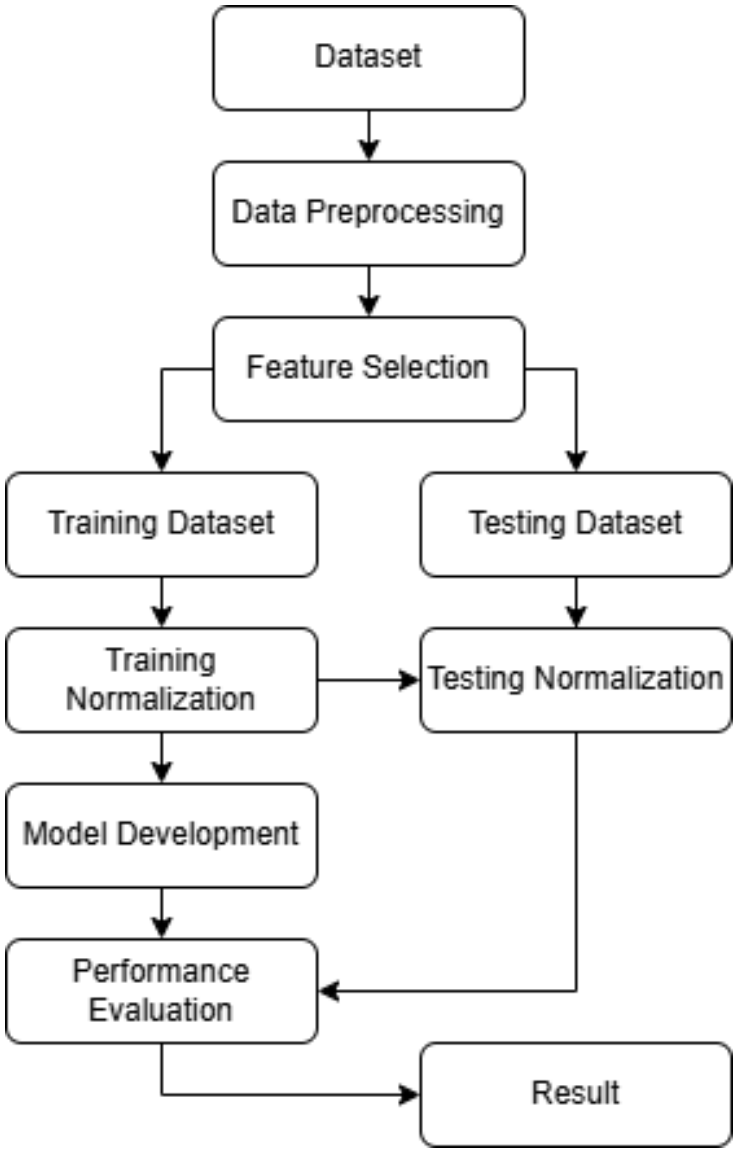
					○ No need for hand-designed components like anchor boxes.

Datasets

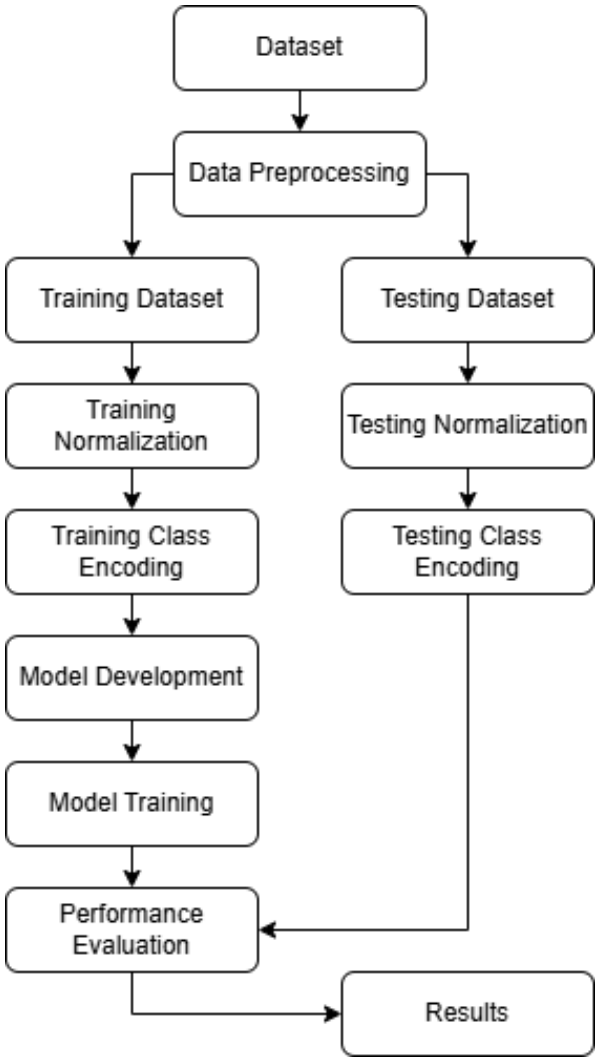
Intrusion Detection System		Facial Recognition		Object detection	
Dataset	Description	Dataset	Description	Dataset	Description
UNSWNB15		LFW (Labeled Faces in the Wild)		**COCO (Common Objects in Context)**	• **Description**: COCO is one of the most popular datasets for object detection, segmentation, and captioning. It contains 330K images with 80 object categories. • **Key Features**: ○ 80 object categories. ○ Dense annotations (bounding boxes, segmentation masks). ○ Large-scale and diverse. • **Use Case**: General-purpose object detection and segmentation. • **Link**: COCO Dataset
NSLKDD		Custom Dataset		**Pascal VOC (Visual Object Classes)**	• **Description**: Pascal VOC is a classic dataset for object detection and segmentation. It contains 20 object categories. • **Key Features**: ○ 20 object categories. ○ Annotations for bounding boxes and segmentation. ○ Smaller than COCO but widely used for benchmarking.

					• **Use Case**: General-purpose object detection. **Link**: Pascal VOC Dataset

CSE-CIC-IDS2018				**Open Images Dataset**	• **Description**: Open Images is a large-scale dataset with over 9 million images and 600 object categories.
					• **Key Features**:
					  ○ 600 object categories.
					  ○ Annotations for bounding boxes, segmentation, and relationships.
					  ○ High diversity and large scale.
					• **Use Case**: Large-scale object detection and segmentation.
					• **Link**: Open Images Dataset



Intrusion detection Model



Object detection/Facial recognition