# Recommended Open Source CNN Models for Fabric Defect Detection

This document provides a curated list of open-source CNN-based models suitable for fabric defect detection using classification + localization (object detection via bounding boxes). These models are optimized for near real-time inference, making them suitable for industrial deployment.

## YOLOv5

YOLOv5 is a state-of-the-art object detection model known for its speed and accuracy. It supports classification and bounding box localization. YOLOv5 is lightweight and deployable on edge devices.

🔗 Source Code: https://github.com/ultralytics/yolov5

## YOLOv8

YOLOv8 is an improvement over YOLOv5 with updated architecture and training pipeline. It is designed for better performance while retaining real-time inference capabilities.

🔗 Source Code: https://github.com/ultralytics/ultralytics

## EfficientDet

EfficientDet is a scalable and efficient object detector based on EfficientNet as backbone. It provides a good trade-off between accuracy and speed.

🔗 Source Code: https://github.com/google/automl/tree/master/efficientdet

## RetinaNet

RetinaNet is a one-stage object detector that introduces focal loss to handle class imbalance. It is known for good accuracy and relatively fast inference.

🔗 Source Code: https://github.com/fizyr/keras-retinanet

## Faster R-CNN (with ResNet-50)

Faster R-CNN is a two-stage detector that provides high accuracy. When used with a lightweight backbone like ResNet-50, it can still deliver decent inference times.

🔗 Source Code: https://github.com/pytorch/vision/tree/main/references/detection