Common object detection libraries:

- **YOLO**
- **TensorFlow Object Detection API**
- **Detectron2**
- **MM Detection**
- **OpenCV DNN**

1. **Detectron**

Detectron2 Model	Small Object Detection	Number of Objects at Once	Object Classes	Key Improvement	Framework
Faster R-CNN	Very good	50+	Any (custom classes)	High accuracy, strong baseline	PyTorch
Mask R-CNN	Excellent	50+	Any (custom classes)	Adds segmentation (object shapes)	PyTorch
RetinaNet	Good	50-100+	Any (custom classes)	Balances speed + accuracy, handles class imbalance	PyTorch
Keypoint R-CNN	Very good	50+	Any (custom classes)	Detects keypoints (e.g. human joints) + objects	PyTorch
DensePose	N/A (pose focus)	N/A	Human body parts	Maps body surface in 3D	PyTorch
Panoptic FPN	Very good	50+	Any (custom classes)	Combines detection + segmentation + background	PyTorch

2. YOLO

YOLO Version	Small Object Detection	Number of Objects at Once	Object Classes	Key Improvement	Framework
YOLOv1	Poor	Struggles beyond ~10-20	~20 (VOC/COCO)	First fast detector, misses small stuff	Darknet
YOLOv2 (YOLO9000)	Better than v1	20-30	~9000 (YOLO9000 dataset)	More classes + better accuracy	Darknet
YOLOv3	Good	30-50+	~80 (COCO)	Multi-scale detection (small + big objects)	Darknet
YOLOv4	Very good	50+	~80 (COCO)	Accurate + fast on normal GPUs	Darknet
YOLOv5	Excellent	50-100+	Any (custom classes)	Small model, easy to train, fast	PyTorch
YOLOv7	Very good	100+ (even in dense scenes)	Any (custom classes)	Great real-time detection, dense objects	PyTorch
YOLOv8	Excellent	100+	Any (custom classes)	Latest, also does segmentation + classification	PyTorch

3. Tensor flow

Model Version	Small Object Detection	Number of Objects at Once	Object Classes	Key Improvement	Framework
SSD	Decent	20-50	Any (customizable)	Fast, good for real-time, light model	TensorFlow
Faster R-CNN	Very good	50+	Any (customizable)	High accuracy, handles small objects well	TensorFlow
R-FCN	Good	50+	Any (customizable)	Balance of speed + accuracy	TensorFlow
CenterNet	Good	50+	Any (customizable)	Can detect objects + keypoints (center + pose)	TensorFlow
EfficientDet	Very good	50-100+	Any (customizable)	Small + accurate + efficient	TensorFlow
Mask R-CNN	Very good	50+	Any (customizable)	Detects objects + their shapes (segmentation)	TensorFlow

4. MMDetection

MMDetection Model	Small Object Detection	Number of Objects at Once	Object Classes	Key Improvement	Framework
Faster R-CNN	Very good	50+	Any (custom classes)	Standard high-accuracy detector	PyTorch
Mask R-CNN	Excellent	50+	Any (custom classes)	Adds segmentation (object masks)	PyTorch
RetinaNet	Good	50-100+	Any (custom classes)	Solves class imbalance, balances speed + accuracy	PyTorch
Cascade R-CNN	Excellent	50+	Any (custom classes)	Multi-stage, more accurate than Faster R-CNN	PyTorch
YOLO (via MMDetection)	Excellent	50-100+	Any (custom classes)	Real-time detection (integrated YOLO models)	PyTorch
FCOS (anchor-free)	Good	50-100+	Any (custom classes)	No anchor boxes, simpler setup	PyTorch
ATSS	Good	50-100+	Any (custom classes)	Adaptive training sample selection	PyTorch
CenterNet	Good	50-100+	Any (custom classes)	Detects center points, keypoints	PyTorch
EfficientDet (via MMDetection)	Very good	50-100+	Any (custom classes)	Small + accurate + fast	PyTorch

5. Open CV

OpenCV Detection	Small Object Detection	Number of Objects at Once	Object Classes	Key Improvement	Framework
OpenCV Haar Cascade	Poor	1-5	Limited (face, eye, plate, etc.)	Very fast, old-school, basic detection	OpenCV (C++ / Python)
OpenCV DNN + YOLO / SSD / Faster R-CNN	Depends on model used	Depends on model (10-100+)	Any (custom classes)	Runs modern models in OpenCV pipeline	OpenCV (wraps models like YOLO, SSD, etc.)