**📚 Complete AI Computer Vision Learning Curriculum**

**Phase 1 – Foundations (Weeks 1–2)**

**Goal:** Learn ML/DL basics + classification.

**Courses & Tutorials**

* 📖 *Deep Learning with PyTorch: A 60 Minute Blitz* (official, free) → [link](https://pytorch.org/tutorials/beginner/deep_learning_60min_blitz.html)
* 🎥 *Intro to Deep Learning with PyTorch* (free on YouTube by Aladdin Persson).
* 🎥 *Stanford CS231n (Convolutional Neural Networks for Visual Recognition)* → legendary lectures (YouTube).
* Paid option: [Fast.ai Practical Deep Learning for Coders](https://course.fast.ai/) — project-focused, excellent for beginners.

**Books**

* *Deep Learning with Python* (François Chollet) → Keras-based, but concepts are universal.
* *Dive into Deep Learning* (free interactive book with PyTorch code): [link](https://d2l.ai/).

**Phase 2 – Object Detection (Weeks 3–6)**

**Goal:** YOLO + other detectors.

**Courses & Tutorials**

* 🎥 *YOLOv8 Official Ultralytics Tutorials* (YouTube + docs).
* 🎥 Roboflow’s *Train YOLOv8 on Custom Data* (step by step).
* 📖 PyTorch *Object Detection Finetuning Tutorial* (official): [link](https://pytorch.org/tutorials/intermediate/torchvision_tutorial.html).
* 🎥 *Computer Vision with PyTorch* (freeCodeCamp, 7 hrs, full project examples).

**Books**

* *Programming Computer Vision with Python* (Jan Erik Solem) — a bit older, but good for fundamentals.
* *Practical Deep Learning for Cloud, Mobile & Edge* (Apress) — includes detection deployment.

**Phase 3 – Segmentation & Pose (Weeks 7–10)**

**Goal:** Mask R-CNN, YOLO-seg, OpenPose.

**Courses & Tutorials**

* 🎥 *Mask R-CNN Explained & Implemented* (YouTube: Aladdin Persson, CodeEmporium).
* 🎥 *Segmentation with Detectron2* (YouTube: Computer Vision Engineer).
* 📖 *PyTorch Tutorials: TorchVision Instance Segmentation* → [link](https://pytorch.org/tutorials/intermediate/torchvision_tutorial.html).
* 🎥 *OpenPose Human Pose Estimation* (YouTube walk-throughs).

**Books**

* *Deep Learning for Computer Vision* (Packt Publishing).
* *Computer Vision: Models, Learning, and Inference* (Simon Prince — free PDF).

**Phase 4 – Transformers & Foundation Models (Weeks 11–16)**

**Goal:** ViT, DETR, CLIP, SAM.

**Courses & Tutorials**

* 🎥 *Transformers for Vision* (YouTube: Hugging Face + DeepLearning.AI).
* 📖 *An Image is Worth 16x16 Words* (original ViT paper — read abstract & diagrams).
* 🎥 *DETR Object Detection Explained* (YouTube: Yannic Kilcher review).
* 🎥 *CLIP Tutorial* (Hugging Face YouTube).
* 🎥 *Segment Anything (SAM) Demo & Code Walkthrough* (YouTube: Roboflow).

**Books**

* *Transformers for Natural Language Processing* (Denis Rothman) — mostly NLP but has CV chapters.
* *Deep Learning for Vision Systems* (Mohamed Elgendy).

**Phase 5 – Real Projects & Deployment (Ongoing)**

**Goal:** Apply knowledge + deploy apps.

**Courses & Tutorials**

* 🎥 *Deploy YOLOv8 with Flask/FastAPI* (YouTube tutorials, many available).
* 🎥 *ONNX & TensorRT for Model Deployment* (YouTube: DigitalSreeni, NVIDIA).
* 📖 *Full Stack Deep Learning Bootcamp* (free materials): [link](https://fullstackdeeplearning.com/).
* 🎥 *Deploy ML to Raspberry Pi/Jetson Nano* (YouTube: Edje Electronics).

**Books**

* *Designing Machine Learning Systems* (Chip Huyen).
* *Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow* (Aurélien Géron) — deployment focus.

**🗓 Suggested Weekly Plan Recap**

* **Weeks 1–2**: PyTorch basics + ResNet/EfficientNet (classification).
* **Weeks 3–6**: YOLO & detection (build a custom dataset).
* **Weeks 7–10**: Segmentation & pose estimation.
* **Weeks 11–16**: Transformers (ViT, DETR, CLIP, SAM).
* **Afterward**: Real projects (fig tree scanner, healthcare CV apps).

⚡ **Pro tip**: Don’t just watch courses — **build mini-projects each week** (like a classifier, then a detector, then a segmenter). This makes the knowledge stick.

Would you like me to also **bundle this into a printable learning tracker** (like a PDF or Excel sheet with checkboxes, links, and milestones), so you can follow along and mark progress?