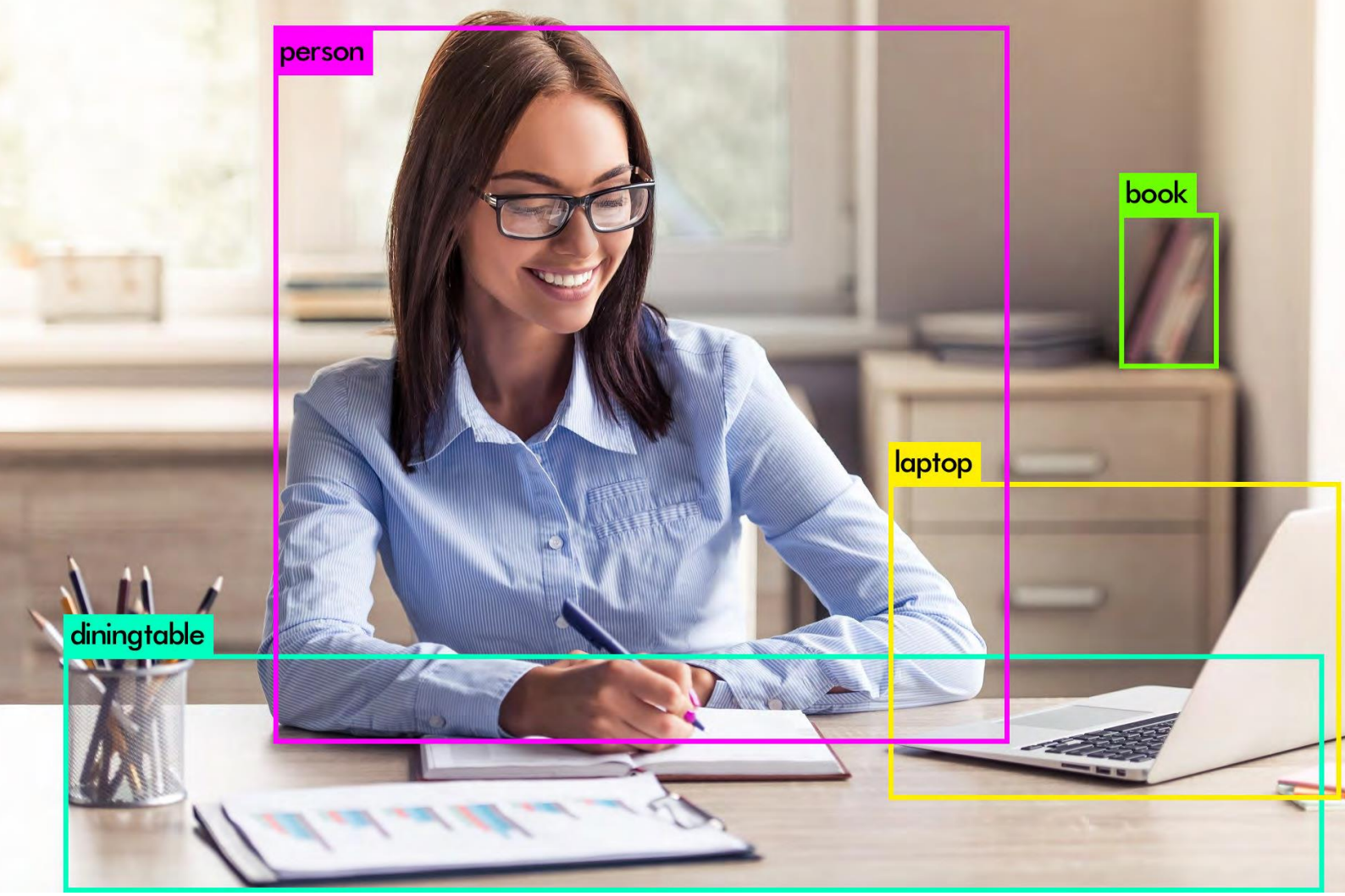

Quick Start: Test already trained YOLO v5

"Detect objects on image, video and in real time by camera with already trained YOLO v5"

Step 1: Install Miniconda

- Open browser window
- Navigate to: https://conda.io/en/latest/index.html
- Download Miniconda installer (Windows, Mac or Linux)
- Run installation
- Verify installation

Windows: open Anaconda Prompt.
Mac or **Linux**: open terminal window.
All the commands are the same for Windows, Mac and Linux.

Command	Description
`conda list`	Prints list of packages
`conda create --name yolov5env python=3.9`	Creates separate environment
`conda activate yolov5env`	Activates created environment
`python --version`	Prints version of *Python*

Step 2: Create directories

- Create one for the course
- Create one for the 1st Section

Windows: open Anaconda Prompt.
Mac or **Linux**: open terminal window.
All the commands are the same for Windows, Mac and Linux.

Command	Description
`mkdir yolov5course`	Creates directory for the entire course
`cd yolov5course`	Navigates to the created directory
`mkdir section1`	Creates directory for the Section 1
`cd section1`	Navigates to the created directory

Step 3: Clone or Download YOLO v5

- Clone or Download YOLO v5
- Install YOLO v5
- Verify functionality of YOLO v5

Windows: open Anaconda Prompt.
Mac or **Linux**: open terminal window.
All the commands are the same for Windows, Mac and Linux.

Command	Description
`conda activate yolov5env`	Activates created environment
`conda install -c anaconda git`	Installs git package
`cd yolov5course\section1`	Navigates to the Section 1 directory
`git clone https://github.com/ultralytics/yolov5`	Clones YOLO v5
`cd yolov5`	Navigates to the main YOLO v5 directory
`dir`	Prints all the sub-directories and files
`pip install -r requirements.txt`	Installs all the requirements for YOLO v5
`python detect.py --help`	Verifies successful installation of YOLO v5

Step 4: Detect objects

- Download test image and test video
- Create additional directory
- Apply trained YOLO v5 on COCO dataset to:
  - detect objects on image
  - detect objects on video
  - detect objects by camera
- Install PyTorch for CUDA to use YOLO v5 on GPU: https://pytorch.org/get-started/locally

Windows: open Anaconda Prompt.
Mac or **Linux**: open terminal window.
All the commands are the same for Windows, Mac and Linux.

Command	Description
`conda activate yolov5env`	Activates created environment
`cd yolov5course\section1\yolov5`	Navigates to the main YOLO v5 directory
`mkdir videos`	Creates directory to keep video files
`python detect.py --help`	Prints all the available arguments

Detect objects on the image file (to run on GPU add: --device 0)
`python detect.py --source data\images\image_to_test_section1.jpg --conf-thres 0.5 --save-txt --line-thickness 4`

Detect objects on the video file (to run on GPU add: --device 0)
`python detect.py --source data\videos\video_to_test_section1.mp4 --conf-thres 0.5 --save-txt --line-thickness 4`

Detect objects in real time by camera (to run on GPU add: --device 0)
`python detect.py --source 0 --conf-thres 0.5 --save-txt --line-thickness 4`

(*) Install PyTorch for CUDA to use YOLO v5 on GPU
`conda install pytorch torchvision torchaudio cudatoolkit=11.3 -c pytorch`

(*) Identify the command for your machine here: https://pytorch.org/get-started/locally

Verify successful installation of YOLO v5 to be used with GPU
`python -c "import torch; print(torch.cuda.is_available()); print(torch.cuda.device_count());` `print(torch.cuda.current_device()); print(torch.cuda.get_device_name(0))"`

Step 5: Show results

- Open File Manager
- Navigate to the main YOLO v5 directory
- Show resulted image and video files that are located in:
  - `yolov5course\section1\yolov5\runs\detect\exp`
- Show txt files with coordinates that are located in:
  - `yolov5course\section1\yolov5\runs\detect\exp\labels`

Links

Check out additional links with extra information for further readings:

- ✓ Main Conda page
- ✓ Main Miniconda page
- ✓ Interactive Table to identify the command to install PyTorch with CUDA
- ✓ COCO dataset classes Explorer

COCO dataset classes

ID	Name
0	person
1	bicycle
2	car
3	motorcycle
4	airplane
5	bus
6	train
7	truck
8	boat
9	traffic light
10	fire hydrant
11	stop sign
12	parking meter
13	bench
14	bird
15	cat
16	dog
17	horse
18	sheep
19	cow
20	elephant
21	bear
22	zebra
23	giraffe
24	backpack
25	umbrella
26	handbag

ID	Name
27	tie
28	suitcase
29	frisbee
30	skis
31	snowboard
32	sports ball
33	kite
34	baseball bat
35	baseball glove
36	skateboard
37	surfboard
38	tennis racket
39	bottle
40	wine glass
41	cup
42	fork
43	knife
44	spoon
45	bowl
46	banana
47	apple
48	sandwich
49	orange
50	broccoli
51	carrot
52	hot dog
53	pizza

ID	Name
54	donut
55	cake
56	chair
57	couch
58	potted plant
59	bed
60	dining table
61	toilet
62	tv
63	laptop
64	mouse
65	remote
66	keyboard
67	cell phone
68	microwave
69	oven
70	toaster
71	sink
72	refrigerator
73	book
74	clock
75	vase
76	scissors
77	teddy bear
78	hair dryer
79	toothbrush