MASTER OF SCIENCE IN ENGINEERING

GPU Robot

Robot NVIDIA jetson - GPU project - Grp. 5

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HES-SO Master

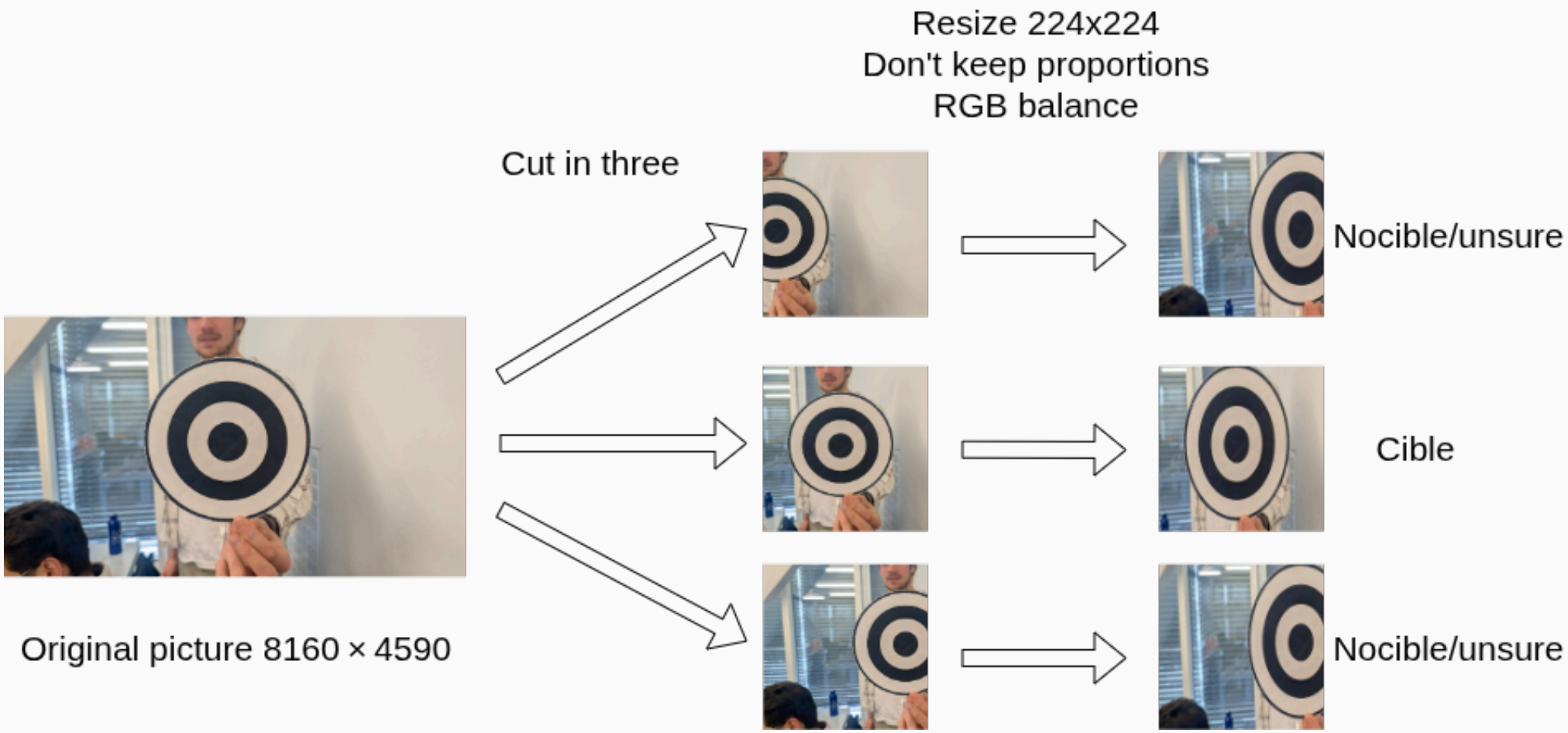
Personal Challenge

- work without CUDA3
- no server pictures

Dataset

taking a picture with personal camera and with the robot every five seconds through PC-webviewer.go

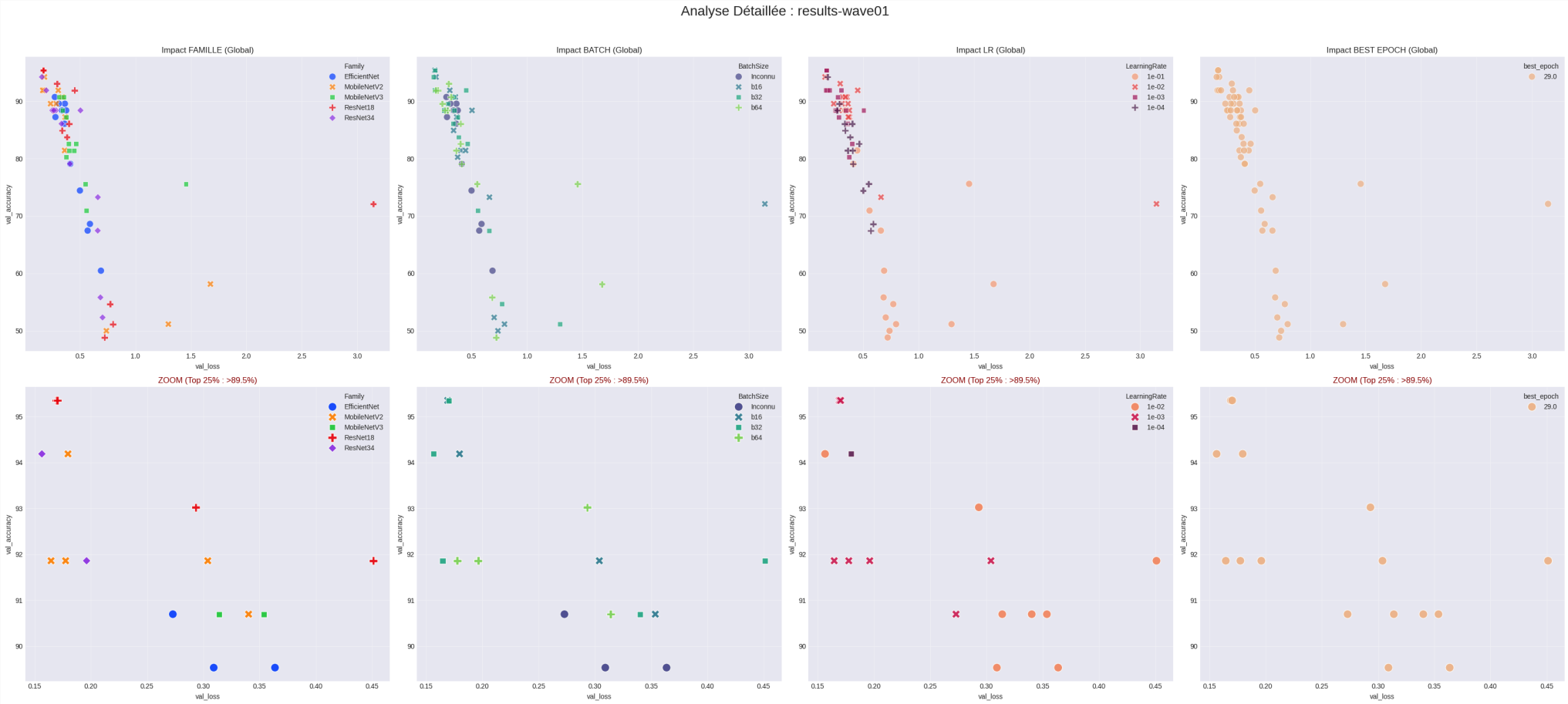
Cutting high res pictures



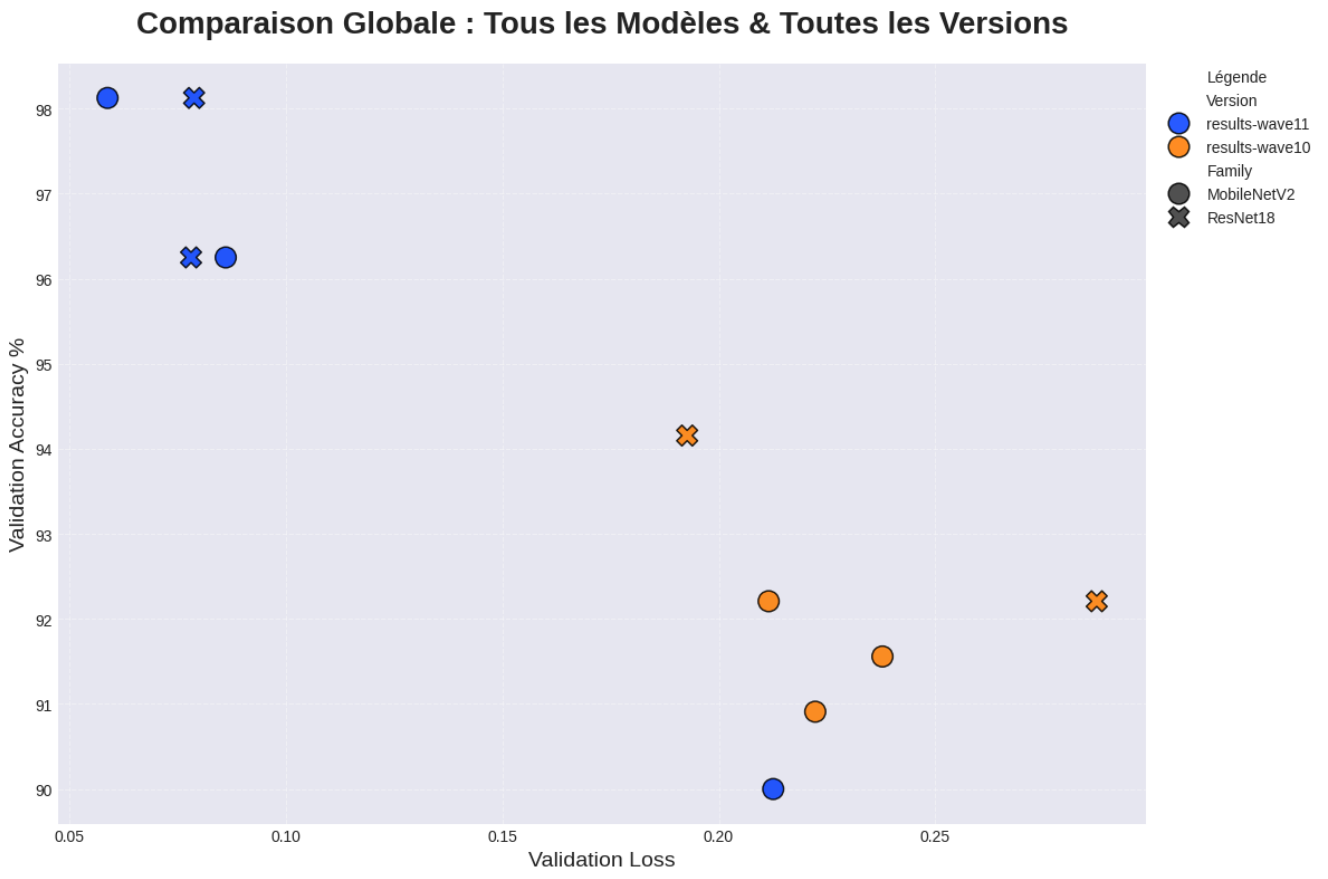
Strategy

- Top 5 models by Gemini
  - ResNet-18
  - MobileNet_v2
- Hyper-parameters
  - Batch size
  - Learning Rate
  - Epoch
- Metrics
  - Accuracy
  - BCE Loss
  - FPS

Model variations



Example



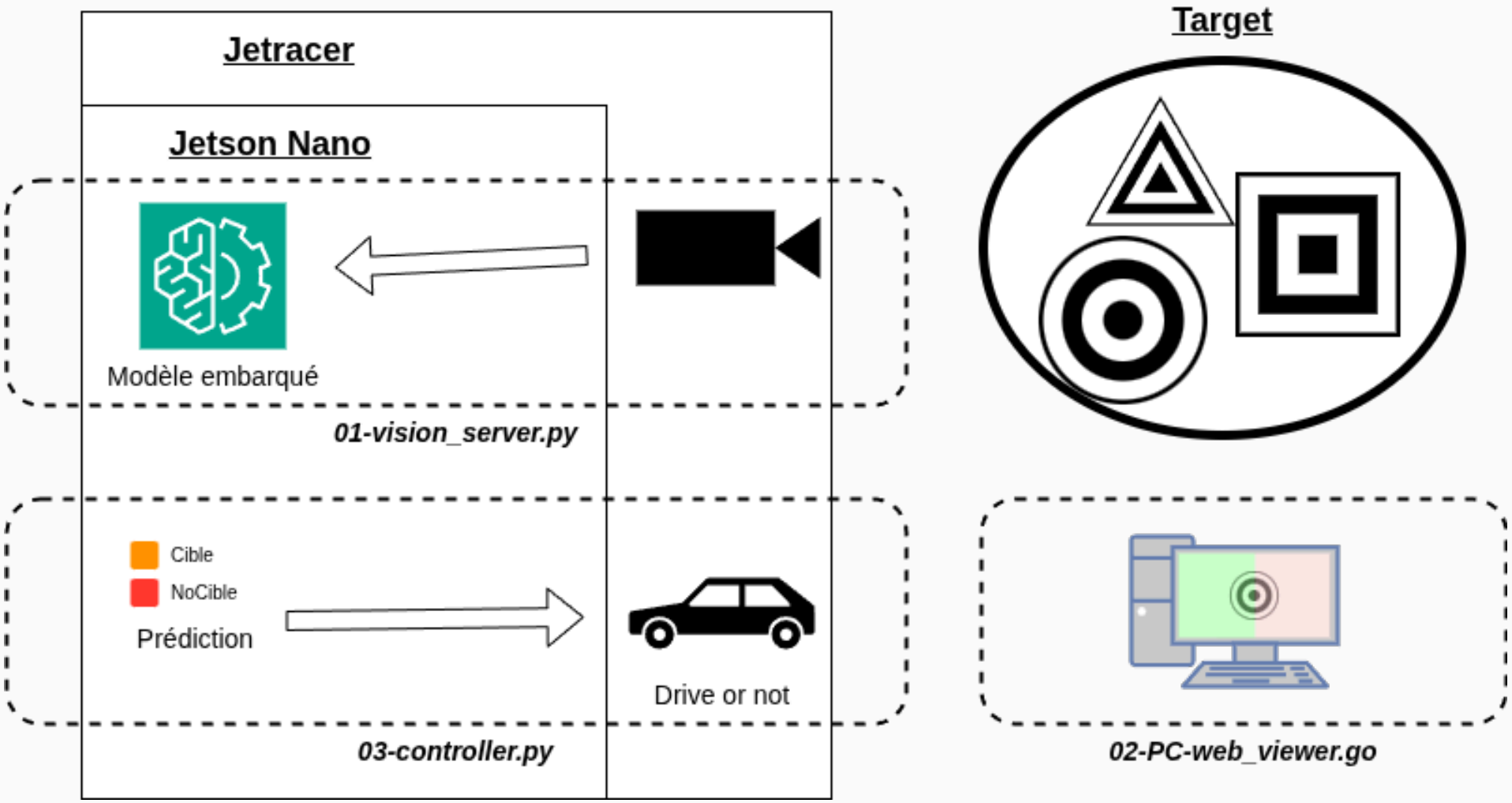
- delete data

Best Model

Model	Batch size	Learning rate	Epochs
mobilenet_v2	16	0,001	40

Accuracy	BCE
98.125 %	0.0588

Inference jetson



Step-up FPS

- ONNX too challenging

$\rightarrow$ TensorRT $\Rightarrow$ 18 $\rightarrow$ 30 FPS

Demo

- Use case 1 ✅
- Use case 2 🟠
- Use case 3 ❌

Self-evaluation

$\Rightarrow$ self-evaluation: 4,5 / 6