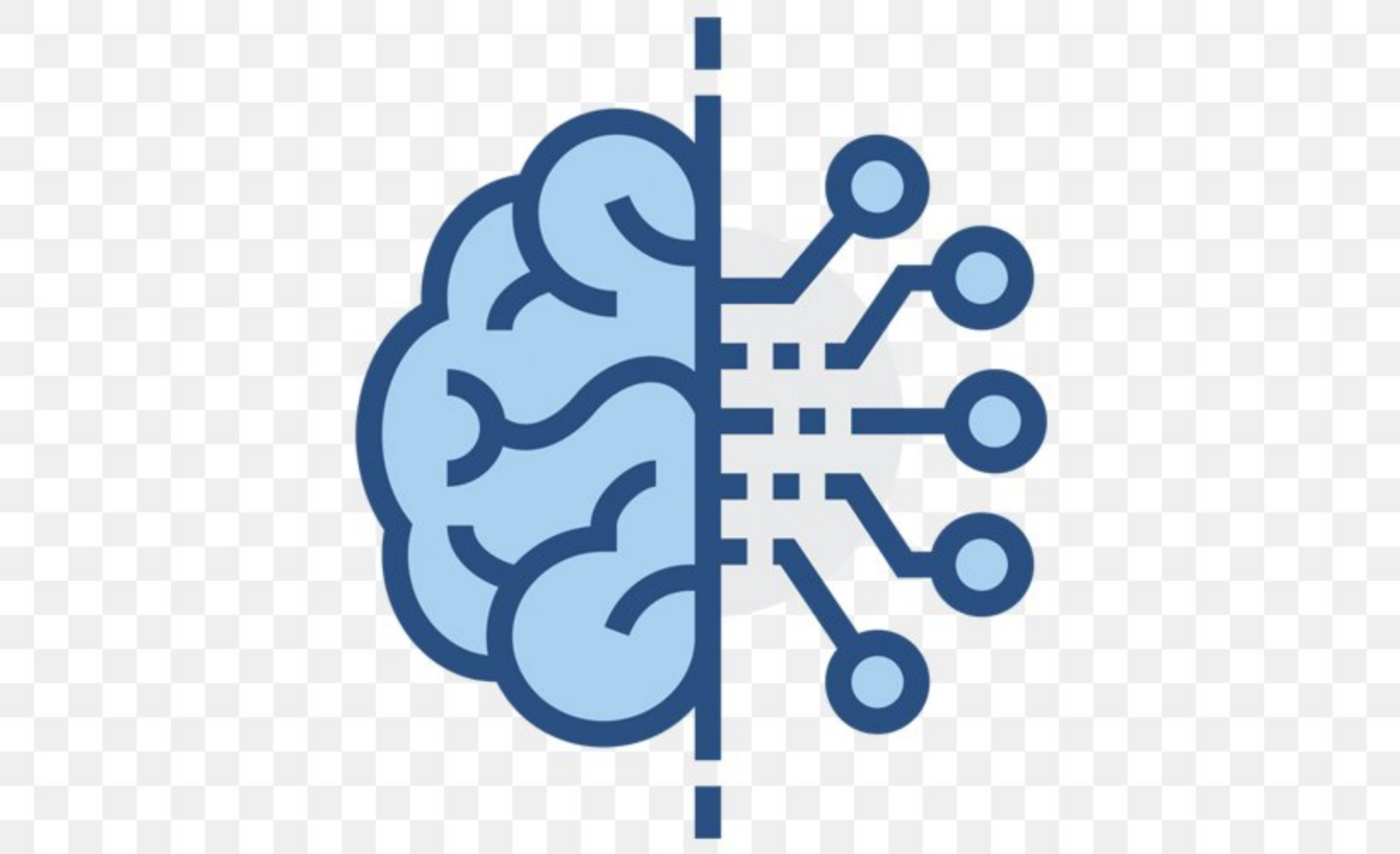
Towards an Inline X-ray Inspection Software Platform

Progress and plans

Zhihua Liang

visionlab

20-12-2019



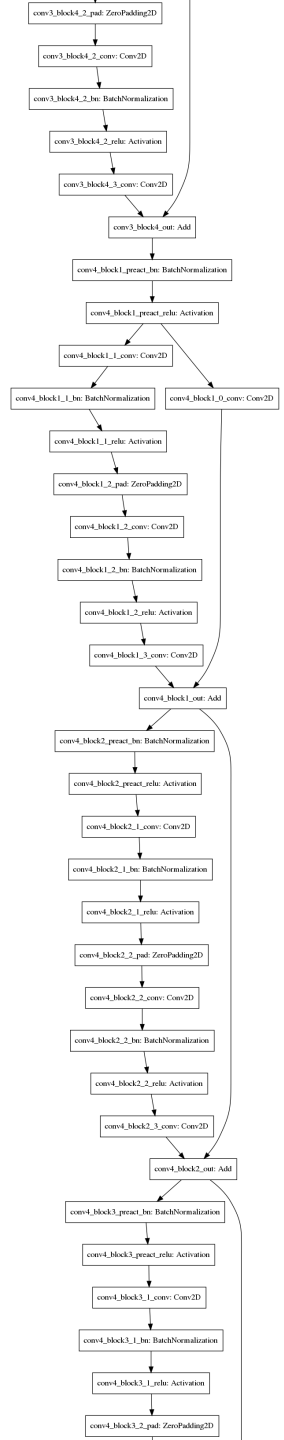
Determine the orientation and position with deep learning

Resnet + Fine tuning

Restnet50

A 50-layers convolutional neural network

Open in Colab



Training

training a ResNet-50 on a single GPU took ~14 days (10^18 single precision ops)

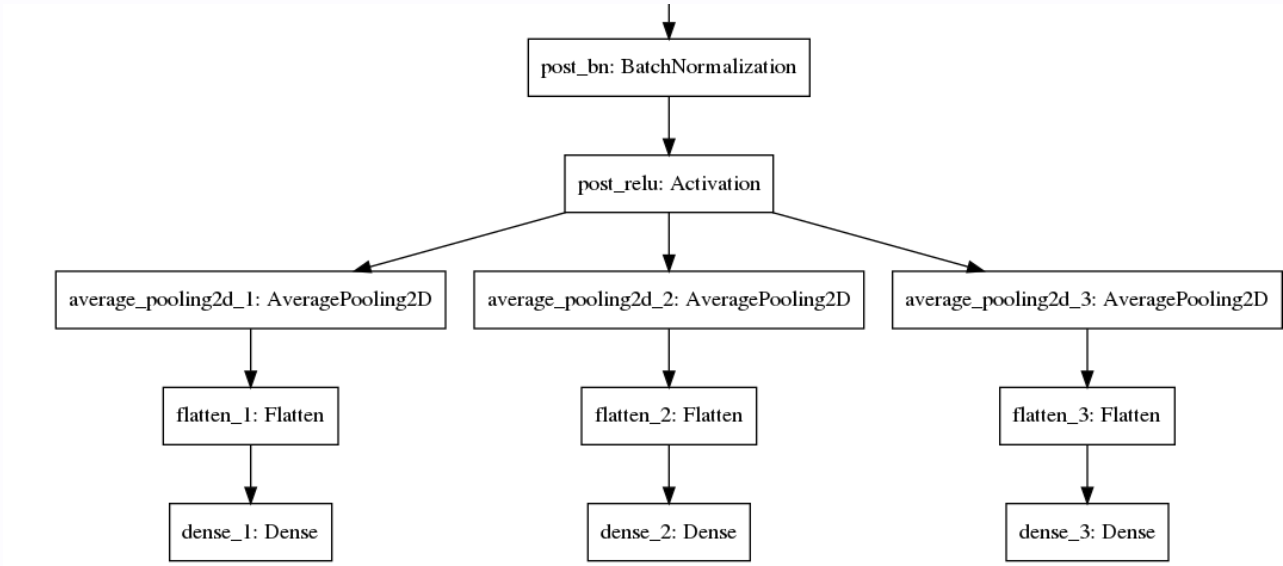
Open in Colab

Fine tuning

Setp 0, get the resnet50 which traned on imagenet without the head layers, then add our own head to it.

Step 1, Freeze the body layers, trains the head layers for 10 epochs

Step 2, Train all the layers for 100 epochs



Open in Colab

Nvidia P100 GPU

~ 20 minutes per epoch

100 epoch = 2000 m = 33 hours ~ one and half day

Euler angles

$$\varphi\text{: } 0^\circ \rightarrow 360^\circ$$

$$\theta\text{: } -10^\circ \rightarrow 10^\circ$$

$$\psi\text{: } -10^\circ \rightarrow 10^\circ$$

Mean Absolute Error

φ: **0.14642**

θ: **0.01692**

ψ: **0.01699**

Happy Christmas (@saibaster)

https://gitlab.com/saibaster