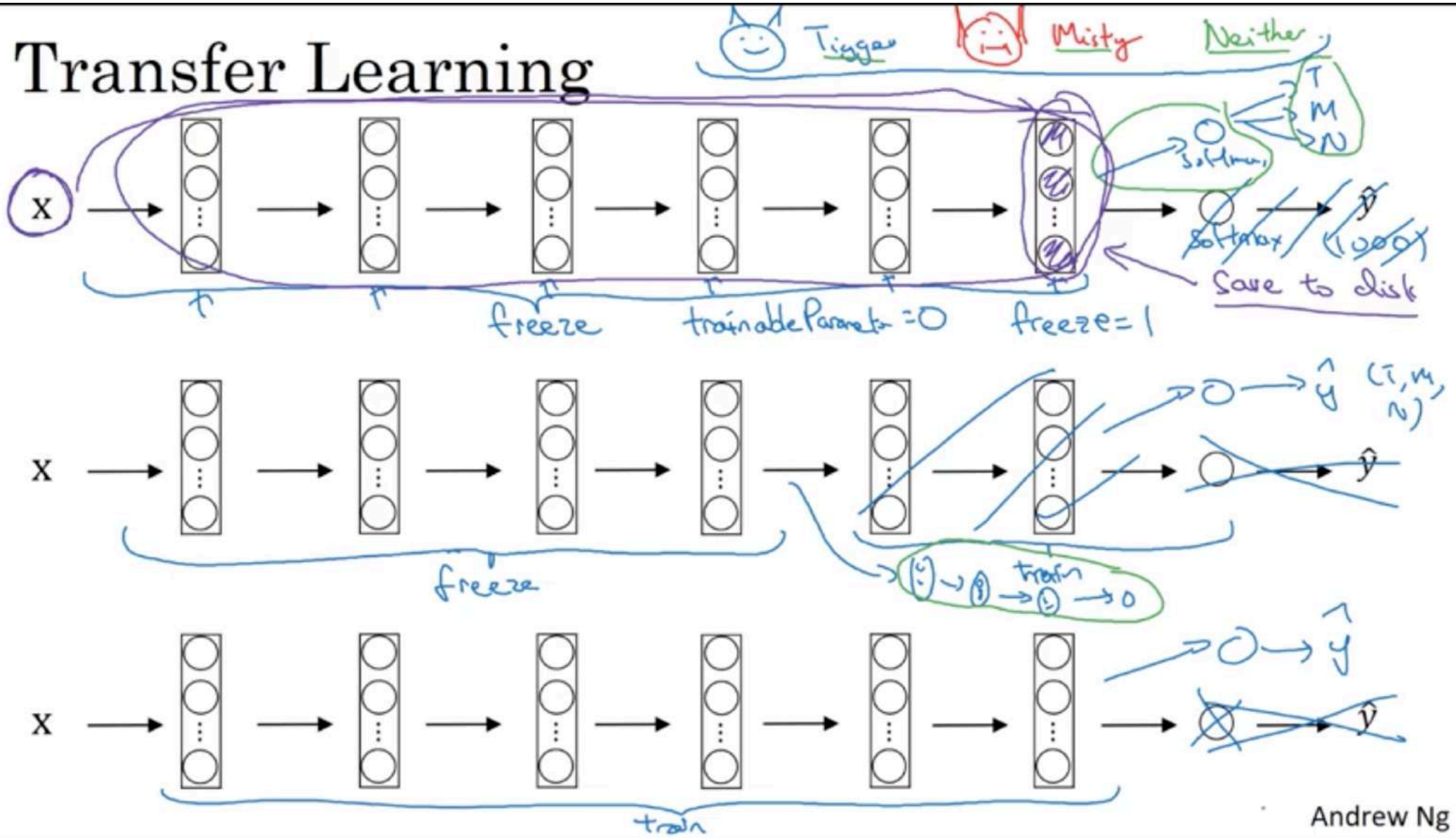
deeplearning.ai

Practical advice for using ConvNets

Transfer Learning

Transfer Learning



Andrew Ng

deeplearning.ai

Practical advice for using ConvNets

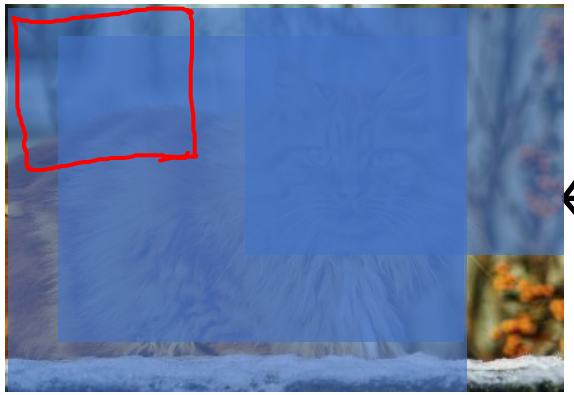
Data augmentation

Common augmentation method

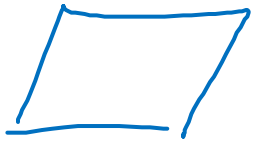
Mirroring

y

Random Cropping



- Rotation
- Shearing
- Local warping
- ...



Andrew Ng

Color shifting

R G B

+20,-20,+20

-20,+20,+20

+5,0,+50

Advanced:

PCA

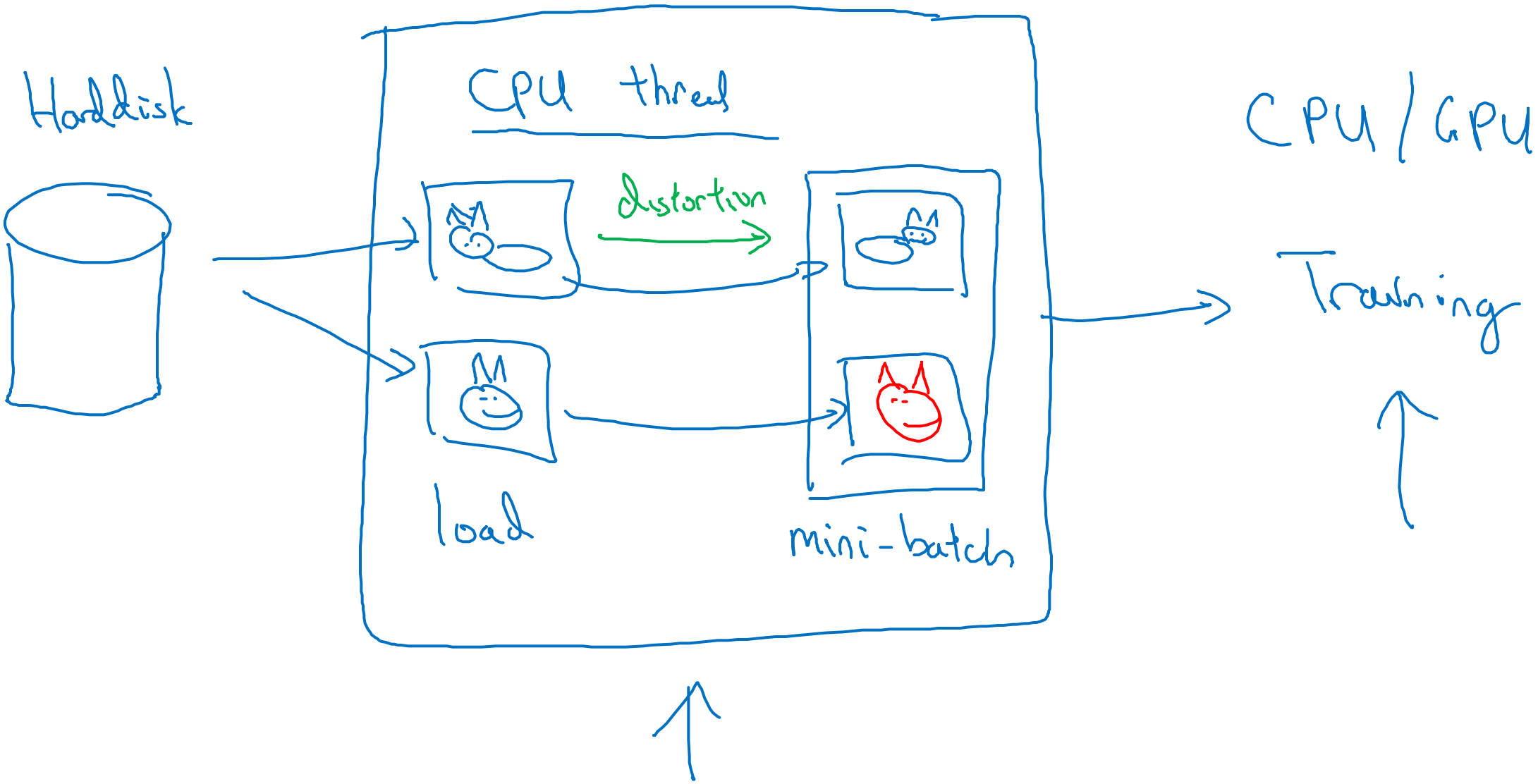
ml-class.org

[AlexNet paper

["PCA color augmentation."

R B G

Implementing distortions during training

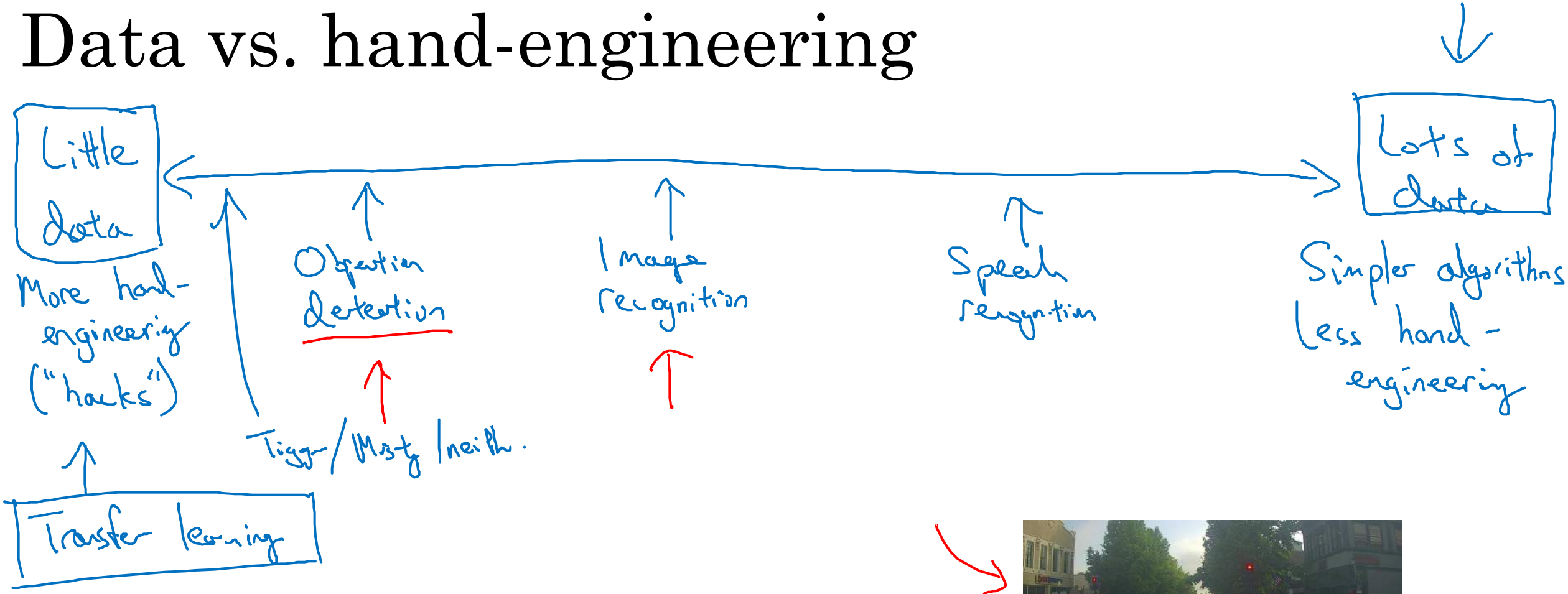


deeplearning.ai

Practical advice for using ConvNets

The state of computer vision

Data vs. hand-engineering



Two sources of knowledge

- Labeled data
- Hand engineered features/network architecture/other components

Andrew Ng

Tips for doing well on benchmarks/winning competitions

Ensembling

3-15 networks → $\hat{y}$

- Train several networks independently and average their outputs

Multi-crop at test time

- Run classifier on multiple versions of test images and average results

10-crop

Use open source code

- Use architectures of networks published in the literature
- Use open source implementations if possible
- Use pretrained models and fine-tune on your dataset