Meeting 1

ETTI-ML Meetings

13.03.2018

Topics

1. Location / resources
2. Review: “Deep Learning for Computer Vision”
   - Starter Bundle
   - Practitioner Bundle
3. GPU on the cloud: floydhub.com
4. Review: “Deep Image Prior”

Location / resources

- Let's hold common stuff (presentations, paper etc.) in a common place

1. Github: https://github.com/ETTI-ML
   - Organization: ETTI-ML
   - Made a repository for meetings: https://github.com/ETTI-ML/meetings
   - Only public repositories for free accounts
   - Alternatives for private repos: gitlab.com, bitbucket.com
2. Shared paper database: Zotero (zotero.com)
   - Keep a common database of papers, review notes, links etc.
   - A little cumbersome
   - Alternatives: Mendeley, EndNote, Paperpile etc

Review: "Deep Learning for Computer Vision"

- Review: "Deep Learning for Computer Vision, With Python", Dr. Adrian Rosebrock, 1st Ed.
- Book + code examples + Virtual Machine
- Comes in three flavours:
  - Starter Bundle
  - Practitioner Bundle
  - ImageNet Bundle (not available)

Review: “Deep Learning for Computer Vision”

- Topic: Deep CNNs for image classification
- Style:
  - little theory
  - examples in Python, explained step by step

Starter Bundle

- Starter Bundle
  - the easiest, contains the basics
- Topics:
  - Basics
    - Image classification basics
    - Basic datasets
    - Stochastic Gradient Descent
  - Neural Network basic architectures
    - Basic layer types
    - Backprop
    - CNN building blocks
    - Example: recognizing handwritten digits (MNIST) with LeNet
  - Some tips & tricks:
    - spotting underfiting / overfiting
    - checkpointing
    - visualize architectures

Practitioner Bundle

- Practitioner Bundle
  - More advanced tips & tricks, but still easy from theoretic p.o.v.
- Topics
  - Advanced (state-of-the-art) CNN architectures for image classification: VGG, GoogLeNet, ResNet
  - Adaptation: train / replace only top layers, keep pre-trained lower layers
  - Various alternatives to SGD (RMSprop etc)
  - More handy tips & tricks: data augmentation, preprocessing, work with HDF5 files
  - Works with larger datasets (Kaggle, subset of ImageNet)

Side topics

- OpenCV is really for image processing
- This guy has a similar book for OpenCV: “Practical Python and OpenCV + Case Studies”

GPU on the cloud: floydhub.com

- floydhub.com
- transfer code automatically to their site & run
- works with Jupyter notebooks (maybe also plain .py files)
- can be run / controlled from Linux command line (nice)
- affordable: Standard GPU, Tesla K80 with 12GB Memory, preemptible: 7$ / 10h ()