Fastai Study Group

• • •

Cleveland AI Group (CAIG)
September 24, 2018 - Week 0

Event Hosts

Michael Kudlaty

@Michael Kudlaty

Jason Mancuso
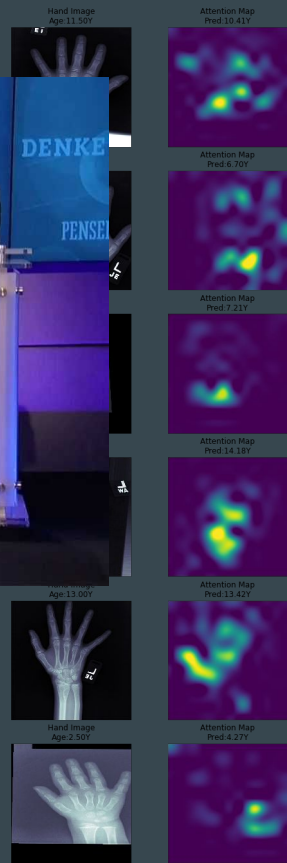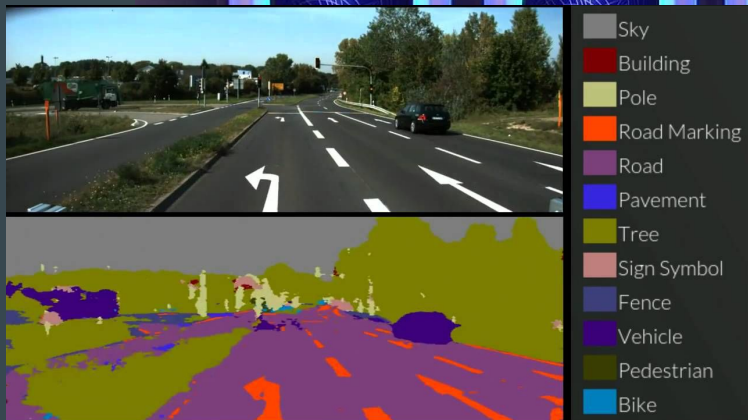
@jvmancuso

Michał Wojczulis

@Michał

Brendan Mulcahy

@Brendan Mulcahy

Agenda

1. Applications of Deep Learning

2. AI Saturdays

3. What is Fastai?

4. What is the purpose of this study group?

5. Demos

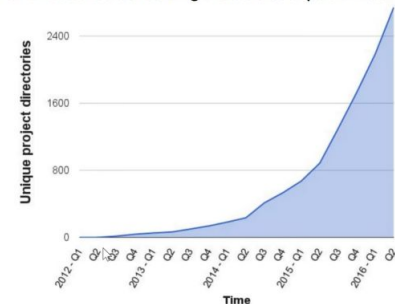6. Environment Setup

7. Q&A

Applications of Deep Learning

- Personal Virtual Assistance

- Classifying Tumor Markers

- Fraud Detection

- Self Driving Cars

Fraud detection	Sales forecasting	Product failure prediction	Pricing
Credit risk	Customer retention / churn	Recommendation systems	Ad optimization
Anti-money laundering	Resume screening	Sales prioritization	Call center routing
Store layout	Store location optimization	Staff scheduling	

Growing Use of Deep Learning at Google

# of directories containing model description files

Across many products/areas:
Android
Apps
drug discovery
Gmail
Image understanding
Maps
Natural language understanding
Photos
Robotics research
Speech
Translation
YouTube
... many others ...

Unity ML-Agents

- [Unity 3d Game Engine Download](#)

- [Unity ML-Agents GitHub](#)

- [MoverBots GitHub](#)

- Tensorflow

- Slack @Brendan Mulcahy
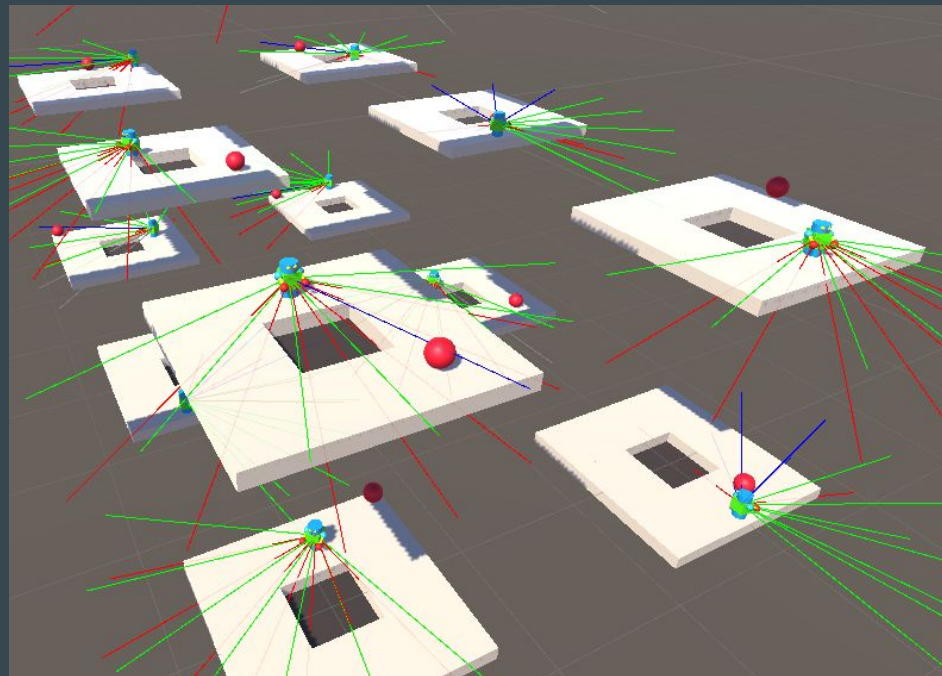
AI Saturdays

Empowering you to learn AI through structured study groups

Study AI in a group

Learn by coding AI projects

Motivation from community

Certification of Participation

Participants are required to complete any one of the following before cycle 2 ends to receive a certificate of participation:

- An AI-related project, open source and with README/ blogpost describing the project.
- At least one code implementation of a research paper on Nurture.ai
- At least 2 summaries of an AI research paper, posted on Nurture.ai articles

AI Saturdays Special Recognition

We want to encourage and recognise AI6 members who took the extra mile in learning Artificial Intelligence.

AI Saturdays Fellow, at least 2 of the following:

- Hosts at least 2 virtual mentoring/studying sessions with AI Saturdays members
- Writes at least 3 articles on AI research papers on AI6 medium publication
- Submit at least one code implementation on Nurture.ai

AI Saturdays Top Achiever

- Completed one capstone project, accompanied with a blogpost on AI6 medium publication
- Completed at least 5 assignments listed on the lesson plans

What is Fastai?

http://www.fast.ai/about/

- Accessible deep learning course online
    - Free
    - No machine learning knowledge required
    - Little programming knowledge required
    - Little math knowledge required
- Top-down approach - working examples in the first week
- Designed for programmers, not researchers
- Two 7-week courses

If you can code you can do Deep Learning

We show you how to get world-class results, step by step

Lesson Content

1. Image Recognition
2. Convolutional Neural Networks (CNN)
3. Overfitting
4. Embeddings
5. Natural Language Processing (NLP)
6. Recurrent Neural Networks (RNN)
7. CNN Architectures
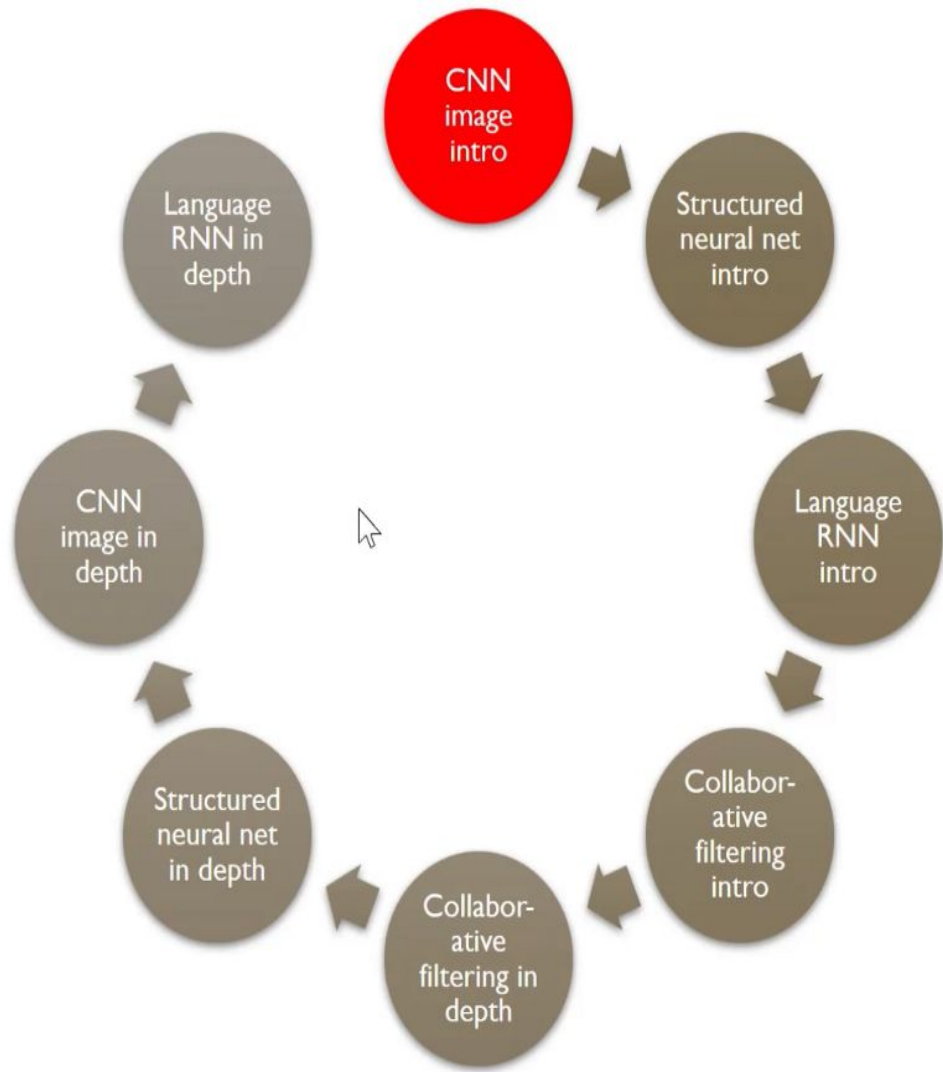
Lesson Schedule

Part 1:

1. Monday 10/1   6:30 PM   Crown Centre
2. Monday 10/8   6:30 PM   Tech Elevator
3. Monday 10/15   6:30 PM   Tech Elevator
4. Monday 10/22   6:30 PM   Tech Elevator
5. Monday 10/29   6:30 PM   Parma-Snow Library
6. Monday 11/5   6:30 PM   Tech Elevator
7. Monday 11/12   6:30 PM   Parma-Snow Library

Part 2 - TBD

Course Details

- Expect to spend 2 - 10 hours per week (i.e. 70 hours total + GPU time)
  - Watch videos at 1.5x - 2.0x
  - Spend most time running python jupyter notebooks
  - Use the notebooks that the video uses (e.g. week 3 might use notebook 2)
- Where to run lessons
  - GPU enabled server
    - Google Cloud Platform (GCP)
    - Kaggle Kernels
    - Paperspace, AWS, more…
  - Local computer with Nvidia GPU
  - Setup steps

How to use the Provided Notebooks

1. Read through the notebook. If everything makes sense, put it aside and create a new notebook.

2. Now try to code the same process as we went through in class.

3. If you get stuck at any point, you can refer to the class notebook. Find the solution to what you are stuck on. Look up the relevant documentation. Put the class notebook aside again, go back to your notebook, and try to code the solution.

4. If you are still stuck, you can refer to the class notebook again. Do not copy and paste the needed code. Instead, type it out yourself. Check that it runs. If so, try changing the inputs, and see if that affects the outputs as you expect.

5. Any time that you feel unsure about why a particular step is being done, or how it works, or why the outputs and inputs are what you observe (or anything else!), please ask on the forums / slack.

6. If the above process is easy for you, you can re-create the class notebooks with a different dataset (Look at Image Datasets for ideas).

Kaggle Kernels

- Free GPU with no waiting/approval

- Deep learning packages (including fastai pre-installed)

- Access to data, can upload own data

- Social features of the platform

- Kernels with fastai DL part 1 course lessons available here

CPU Specifications	GPU Specifications
4 CPU cores 17 Gigabytes of RAM	2 CPU cores 14 Gigabytes of RAM
6 hours execution time 5 Gigabytes of auto-saved disk space (/kaggle/working) 16 Gigabytes of temporary, scratchpad disk space (outside /kaggle/working)	

Where to Learn Python

- Exercism.io

- Learn python through small programming exercises

  - Automated unit tests

  - Mentored mode vs self-guided

  - Similar to Project Euler, but not math focused

- Udemy Deep Learning Prerequisites: The Numpy Stack in Python

  - The Numpy, Scipy, Pandas, and Matplotlib stack: prep for deep learning, machine learning, and artificial intelligence

Next Steps

1. Watch Week 1 Lecture

2. Install python and fastai

3. Play with Lesson 1 jupyter notebook

    a. Cats and dogs

    b. Try using other images

        i. Canadian vs Chinese Geese

        ii. Mario vs Link

4. Slack #deep_learning if you need help setting up

5. Prepare questions and discussion items for Monday

6. Feel free to present your home-work or other AI related topic

Resources

- Course page   http://course.fast.ai/
- Course forums   http://forums.fast.ai/
- Cleveland Tech Slack   https://cleveland-tech.herokuapp.com/
  - Join #deep_learning channel
  - Ask questions or share articles
- AI Saturdays   https://nurture.ai/ai-saturdays
- AI Saturdays guide   Link
- AI Saturdays forums   https://ai6forums.nurture.ai/
- CAIG Website   https://clevelandaigroup.github.io/

Thank You to Our Sponsors!