Deep Learning

Welcome and Course Introduction

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Crew Information

❑ Instructor

- Xinfeng Zhang (张新峰), Assistant Professor (Tenure-track)
- Research interests: Image/video compression, image processing, quality assessment
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- Email: xfzhang@ucas.ac.cn，QQ群：772948784

❑ Teaching Assistant

- Qianqian Xu (许倩倩)，xuqianqian@ict.ac.cn
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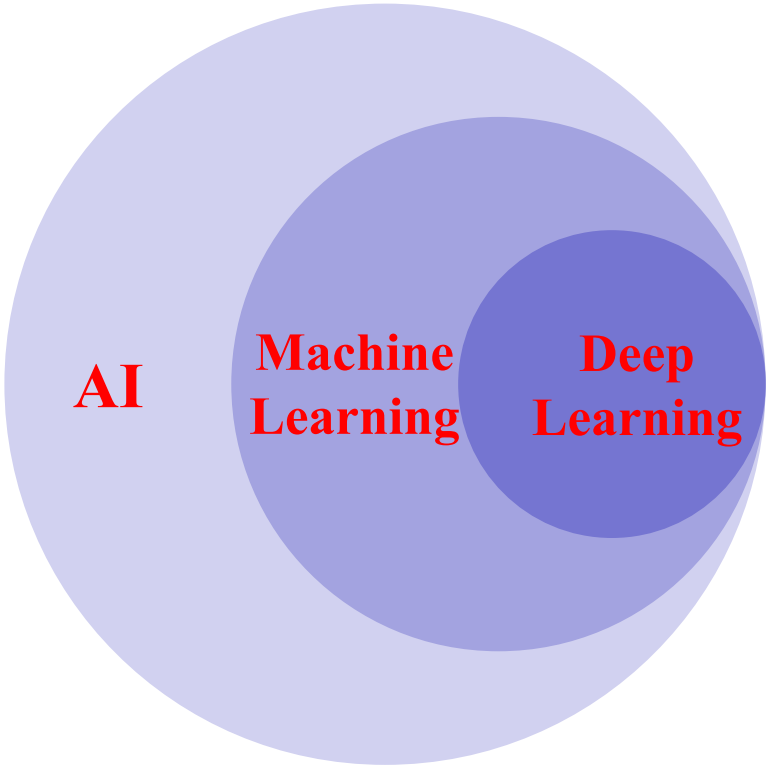
Course Introduction

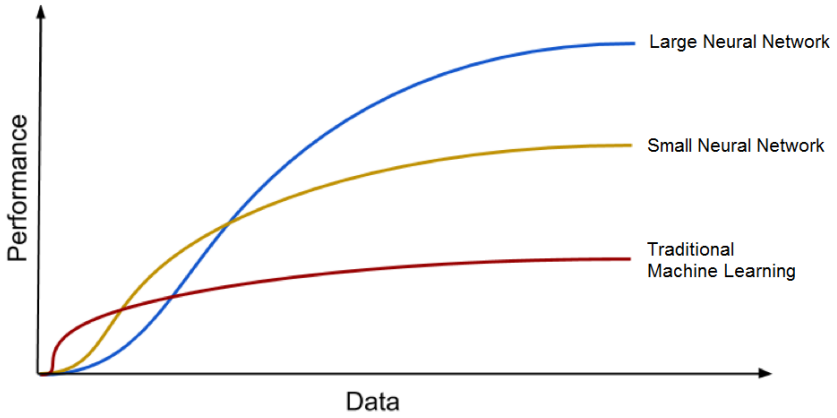
- Course type: Major popularization
- Class hour/credit: 40/2
- Prerequisite courses: Machine learning, linear algebra, statistics, probability theory, Python

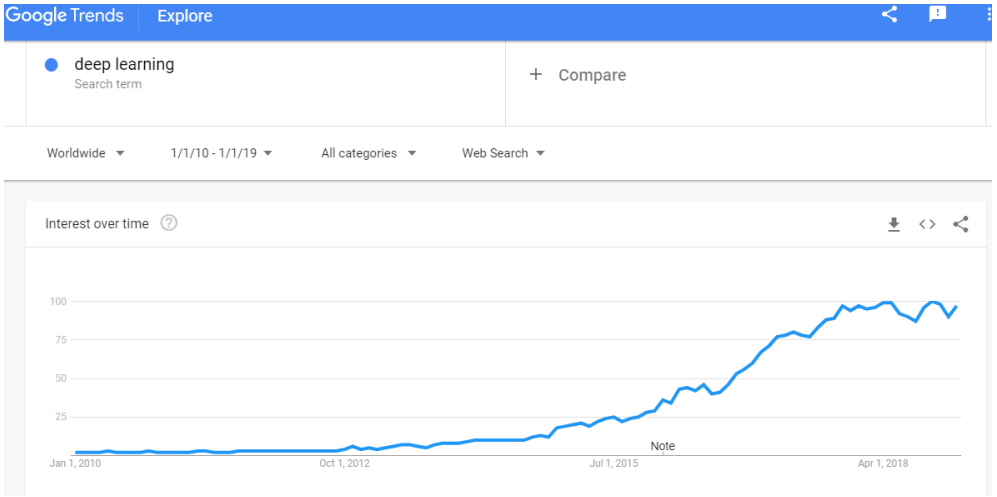
	Languages	Tutorials and training materials	CNN modeling capability	RNN modeling capability	Architecture: easy-to-use and modular front end	Speed	Multiple GPU support	Keras compatible
Theano	Python, C++	++	++	++	+	++	+	+
Tensor-Flow	Python	+++	+++	++	+++	++	++	+
Torch	Lua, Python (new)	+	+++	++	++	+++	++	
Caffe	C++	+	++		+	+	+	
MXNet	R, Python, Julia, Scala	++	++	+	++	++	+++	
Neon	Python	+	++	+	+	++	+	
CNTK	C++	+	+	+++	+	++	+	

Course Introduction

- An efficient tool for artificial intelligence (AI)







Content

- 第一章 引言
- 第二章 深度学习基础
- 第三章 卷积神经网络
- 第四章 循环神经网络
- 第五章 深度生成模型
- 第六章 其他典型深度学习方法
- 第七章 深度学习中的正则化
- 第八章 深度学习工具
- 第九章 深度学习在图像识别中的典型应用
- 第十章 深度学习在语音识别中的典型应用
- 第十一章 深度学习在自然语言处理中的典型应用

Evaluation

- **Content, type and percentage**
  - **Written examination: 45% (open-book)**
  - **Paper reading (for each): 10%**
    - **10 related papers, submit Chinese PPTs**
- **Project (for individual or group): 45%**
  - **Images**
    - **For individual (Required)**
      - Handwritten Numeral Recognition （手写数字识别）
      - Cats & Dogs Classification (猫狗分类）
    - **For group (Optional, at most 3 students/group)**
      - Vehicle License Plate Recognition （车牌识别）
      - Pedestrian detection （行人检测）
      - Video contrast conversion (SDR video to HDR video)

Evaluation

❑ Expected Projects

- **Natural Language Processing**
  - **For individual (Required)**
    - Automatic writing poems (自动写诗)
    - Movie Review Sentiment Classification（电影评论情感分类)
  - **For group (Optional, at most 3 students/group)**
    - Neural Language Model (神经网络语言模型)
    - Neural Machine Translation(神经机器翻译）

Expectation

首届“全国人工智能大赛”鹏城实验室启动 获奖者将获百万奖金及科技巨头招聘绿色通道

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奖项设置	团队数量	奖金金额（每支）
一等奖	1 支	100 万元 10 万元腾讯云代金券
二等奖	2 支	50 万元 5 万元腾讯云代金券
三等奖	3 支	20 万元 2 万元腾讯云代金券
优胜奖	4 支	2 万元 1 万元腾讯云代金券

Reference material (Books)

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- [2] 山下隆义著，张弥译.图解深度学习. 北京：人民邮电出版社，2018.
- [3] Yoav Goldberg著, 车万翔等译. 基于深度学习的自然语言处理. 北京: 机械工业出版社, 2018.
- [4] 猿辅导研究团队. 深度学习核心技术与实践. 北京: 电子工业出版社, 2018.
- [5] 林大贵. TensorFlow+Keras深度学习人工智能实践应用. 北京: 清华大学出版社, 2018.
- [6] 刘祥龙等著. PaddlePaddle深度学习实战.北京: 机械工业出版社, 2018.

Reference material (Online)

- http://openclassroom.stanford.edu/MainFolder/CoursePage.php?course=MachineLearning
- http://deeplearning.net/tutorial/
- http://neuralnetworksanddeeplearning.com/
- http://pytorch123.com/#pytorch

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谢谢！