Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Machine Learning
with Applications in Media Engineering

This module is an introduction course to Machine Learning, with a focus on Deep Learning. It is a fourth/fifth year module offered by the Electronic & Electrical Engineering department to the undergraduate students of Trinity College Dublin.

Syllabus

Part I: Fundamentals of Machine Learning

The course starts with an introduction to some essential aspects of Machine Learning, including Least Squares, Logistic Regression and a quick overview of some popular classification techniques.

Part II: Deep Learning

Then we dive into the fundamentals of Deep Neural Nets (DNNs), with Feed Forward Neural Nets, Convolution Neural Nets and Recurrent Neural Nets.

Finally Students get exposed to recent architectures and strategies for Transfer Learning, GANs, etc.
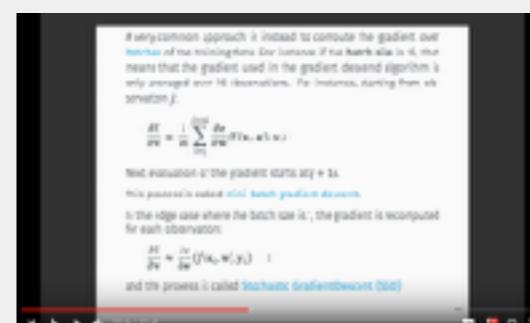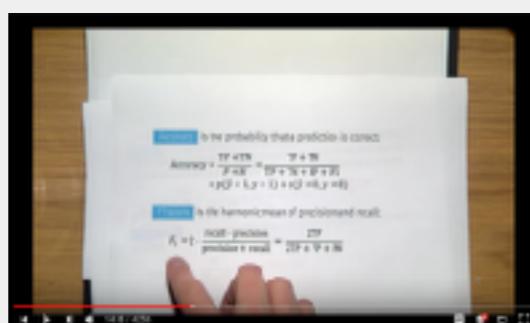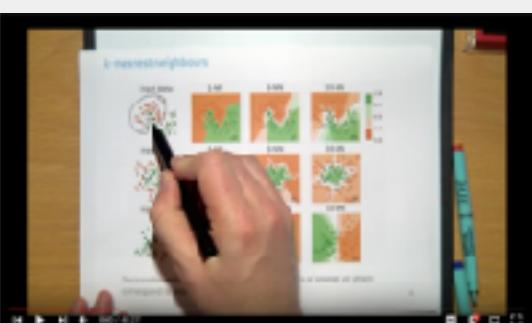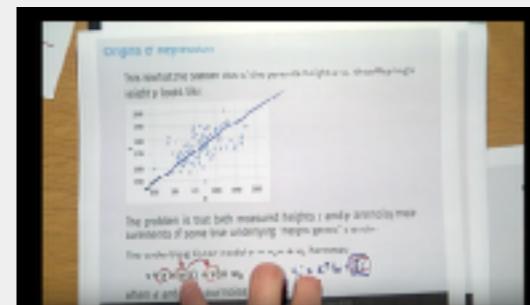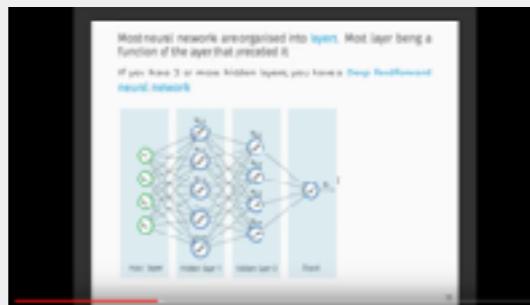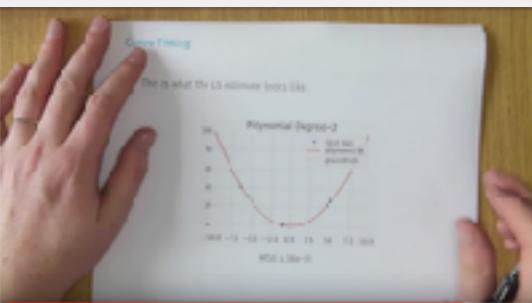
Course Material & Lecture Videos

Lecture material is available online:

https://github.com/frcs/EE4C16

Lecture videos are available on YouTube:

https://goo.gl/DP2jnJ

Industry Keynotes

The course includes keynotes from leading industrial practitioners from Google, Intel and Xilinx

Dr. George Toderici
Google Research

Dr. Michela Blott
Xilinx Research

Dr. Sofiane Yous
Movidius/Intel

Lab Environment

We have also designed a unique environment specifically for this course so that students can learn best industry practices.

Our web platform can transparently connect students to a Google Cloud Platform cluster via web based terminal/editor/jupyter sessions. Labs are automatically assessed to give immediate feedback.

Labs

Labs include image classification challenges for various DNN architectures.

We have adapted Udacity's self driving car simulator, so that students can train and operate an autonomous car using DNNs.

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Students implement a character-based RNN system to generate and detect fake Nietzsche's writings.

The Team

Asst. Prof. François Pitié
His work on colour is being used by Google and movie productions such as "The Hobbit".

Course creator

Dr Hugh Denman
5 years at Google/YT. His code is being used to transcode 400 hours of video/min in YouTube since 2012
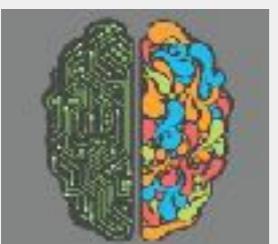
Lab system

Prof. Anil Kokaram
Head of Department EEE,
Oscar Winner 2007,
6 years with Google/YouTube

Industry Keynotes

John Squires
Systems Manager EE

Systems manager

Marco Forte
PhD student

George Streptu
PhD student

Demonstrators
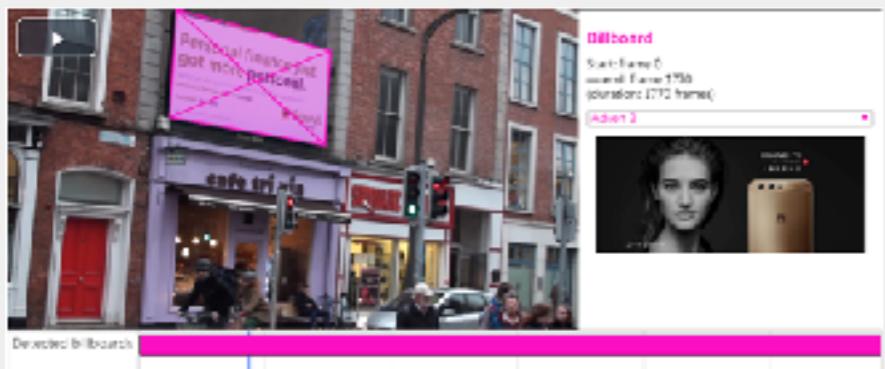
Research

Neural Nets for visual effects:
Demosaicing

Neural Nets for visual effects:
Matting

Neural Nets for visual effects:
Object detection/replacement