DL803/824 – Final Year Project ideas

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Topic: Machine learning

Machine learning involves getting computers to carry out actions without explicitly programming them to do so. For example, the Facebook timeline is governed by a machine learning algorithm. The algorithm 'learns' about the user, e.g. who they friend, what posts they like, etc. and the posts that appear in the user's timeline are based on what the algorithm has 'learned'.

A project in this area could involve selecting an application that would benefit from machine learning (e.g. classifying or clustering social media posts, facial recognition, making music/tv recommendations, automated game playing, etc.), implementing the application with several different machine learning algorithms, and comparing their performance.

Refs: Stanford OpenClassroom – Machine Learning; Coursera – Machine Learning.

Topic: Wearables / Internet of things / Physical computing

Go beyond the typical desktop/laptop/phone/tablet hardware platforms – build your own. Explore projects online for some inspiration. For example, build your own wearable personal data logger, build a home automation system, etc.

Example technologies: Processing; Arduino; Intel Galileo; Raspberry Pi.
Refs: Adafruit Wearables; Instructables.

Topic: Data visualisation

Write software to produce an interactive graphical representation of a data set you are interested in.

Example technologies: Processing; Processing.js; D3.
Refs: http://flowingdata.com/; http://visualisingdata.org; http://bost.ocks.org/mike/.

Topic: Mobile application development with Cloud hosted backend

Design, develop, and test a mobile application that utilises a cloud hosted backend for data storage and/or processing. Document the entire process justifying the choices made and describing the advantages and disadvantages of the technologies used.

Refs: The Making of Tiiny.
Example technologies: Android (Java); iOS (Objective-C); Heroku; Amazon Web Services; Google Cloud Platform; Microsoft Azure.

Topic: Creative coding

Creative coding describes the use of computer programming for primarily creative/artistic purposes. There is a lot of potential for interesting projects in this area, e.g. the development of an interactive audio/visual 'installation' possibly incorporating real-time video tracking or physical interactions (e.g. using an Arduino).

Example technologies: Processing; Processing.js; Cinder; openFrameworks; Arduino.

Topic: Virtual reality

Design, develop, and test a novel and interesting application of the Oculus Rift or Google Cardboard VR systems.

Example technologies: Google Cardboard; Oculus VR.

Topic: Security / Privacy / Anonymity

Given the Snowden revelations and raft of recent high profile hacks, can you think of any interesting applications to improve a user's security, privacy, and/or anonymity while using the Internet?

Refs: Schneier on Security; Krebs on Security.

Topic: Critical analysis of a new technology

Research an interesting new technology of your choice, build something with it, and write a critical analysis of it. One potential technology to explore is node.js—server side JavaScript for event-driven, low-latency, concurrent apps.

Topic: Technology comparison

Similar to the above, however in this case two or more similar technologies are chosen and compared, e.g. iOS development using Swift vs. Objective-C.
