Harnessing the power of Deep Learning

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The hottest topic in ML is Deep Learning, with many startups and large companies entering the field. Here are some links to understand the impact of Deep Learning:
http://venturebeat.com/2014/12/20/5-deep-learning-startups-to-follow-in-2015/
http://www.technologyreview.com/news/524026/is-google-cornering-the-market-on-deep-learning/
https://www.youtube.com/watch?v=czLI3oLDe8M

Its uses range from object recognition, speech recognition, natural language processing, fraud detection and the list keeps growing.

In this project we will build a real Deep Learning system!
The exact application is for you to choose.

How it works?
1. You choose the exact application
2. We think how to implement the right system.
3. We (mostly you) choose the programming language based on your preference and libraries availability. It can even be a language which you’re not familiar with, in order to broaden your programming horizons.

What we will achieve in the project?
1. Develop the program you want to build
2. Experiment with real deep learning systems
3. Freedom to choose your preferred platform to work and acquire advanced programming skills with state of the art technology
4. Study the latest and fastest developing field in computing

Similarly search in peer-to-peer networks

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Peer-to-peer (P2P) networks are highly scalable computer networks. There’s no central management in a P2P network, rather, P2P algorithms are fully decentralized.

P2P networks enable storing and searching for data elements; both are done in a distributed manner.

There are several known P2P architectures such as Chord, Pastry, and CAN.

Similarity search is the task of searching for similar objects (e.g., users, movies and songs, etc.) based on their features.

In this project, you will simulate a P2P network that supports a decentralized similarity search.

BigData: similarity search of Wikipedia articles

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In this project, you will experience with a BigData task.

Given some Wikipedia article, the goal is to find similar articles, based on common content such as text and referenced articles.

A possible application is recommending articles to users.

Since Wikipedia dataset is huge, you will tackle the similarity search challenge with BigData algorithms and
tools. Main algorithms and technologies: Localisty Sensitive Hashing (LSH) similarity search, Big data processing, MapReduce, Hadoop/Spark/GraphLab.

Use Machine Learning for Your Desired Purpose

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Machine learning applications are emerging with new applications by the day. Some of them might sound crazy, but turn out to become a huge success.

In this project YOU decide which problem we're going to solve.

It can be anything you can think of - predicting football scores, estimating the strength of a Texas Holdem hand, stock forecasting, customized movie recommendations from user ratings, or even ranking web search results using personal preference.

**How it works?**
1. You come-up with the problem to solve
2. We discuss it to define the problem and think exactly what can be achieved
3. We (mostly you) choose the programming language based on your preference and libraries availability. It can even be a language which you’re not familiar with, in order to broaden your programming horizons.

**What we will achieve in the project?**
1. Develop the program you think is useful
2. Experiment with machine learning algorithms to understand their differences and applications
3. Freedom to choose your preferred platform to work
4. Acquire advanced programming skills with state-of-the-art libraries and technology

*Note: Knowledge in machine learning isn’t a requirement and the relevant parts will be studied during the process.*
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**Dare you go**

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If you want to develop a social game that allows every player to set a task (e.g. solve a puzzle in N minutes, days, weeks..) and other players to respond by posting a picture or video proving that they have completed the task. The one who completes the task will receive the most votes from other players, where the player who posted the task has a higher percentage in the voting.

Every player will get a score that will be calculated according to the number of tasks they have participated in, succeeded in, posted etc. The score will determine the player’s ranking in the general ranking of players which will be accessible to everyone.

The project will be written in an Android application in Java, with a server side on https://www.parse.com.

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**Proximity-based playlist**

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If you are interested in learning about the possibilities of direct communication between different platforms, you are invited to read more here - https://allseenalliance.org/

In this project we built a system in which users can (by using their Android device) broadcast their musical preferences, and thus influence the music in public places (e.g. bars, shops etc.) in the same place where the music player is connected to the system.

The idea behind the system is that there is no central server to which users connect, but rather connections created on the basis of proximity and direct communication between clients and players.

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**Improving Linux Load Balancer**

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If you are interested in improving the Linux load balancer, you can learn more about the differences between various types of load balancers and how to choose the best one for your needs. You can also experiment with different load balancer implementations and see how they perform under various conditions.

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Current implementation of Linux load balancer does not consider offline cores. In this project we propose an improvement to the load balancing algorithm, implement it on the latest Linux kernel, and test it on a real system.

Website Promotion SEO

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UML State Machine visualizer

UML State Machine visualizer

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MATLAB Application Grid

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Debugger data-structure visualization framework

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Contemporary Debuggers allow inspecting variable in the debugged program based on symbols generated at compile-time. However, this is limited to the language’s built-in constructs such as integers, pointers, structs and classes because these are the entities that the compiler knows about and can provide symbolic information for. It cannot provide information about higher level data-structures such as linked lists, trees and hash tables because these are not built-in language constructs.

The Windows Debuggers (http://msdn.microsoft.com/en-us/library/windows/hardware/ff551063%28v=vs.85%29.aspx) provide a very flexible extensibility interface that allow implementing “visualizers” – generate user-friendly visual representation of complex data-structures. However, implementing visualizers can be quite tedious because the extension code runs in a different process than the data – the extension lives in the debugger, which is a process separate from
the debugged program. In this project we will implement a framework that allows writing the extension using the same syntax as if the raw data live in the same process as the extension. The implementation will be mostly in C++ and at the students discretion a part of it can be implemented in some scripting language (e.g. Python, PERL).

**Identify Characters from Google Street View with Julia**

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Google Street View contains lots of unidentified text by computers, understandable only to humans. In this project we will use characters taken from Google Street View images and identifying them thorough software. It differs from traditional character recognition because all data set contains different character fonts and the background is not the same for all images. In addition, we will use a new emerging scientific programming language called ‘Julia’, designed for easy implementation of technical programs. Check it out at: ‘http://julialang.org/’.

Julia is a high-level language greatly simplifying the amount and complexity of code needed for development of high-level algorithms and has many easy-to-use libraries for parallelism and machine learning algorithms.

*What we will achieve in the project?*
1. Use real data to develop algorithm with practical applications
2. Experiment with machine learning algorithms to understand their differences and applications
3. Freedom of creativity to choose your preferred method of solution
4. Broaden your arsenal of programming languages with Julia

*Knowledge in machine learning isn't a requirement and the relevant parts will be studied during the process*

**System 106 on the web**

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Creating a map and database based WEB system for the management of a municipality accepting and solving complaints 106 system.

The system will be written using database technologies, JavaScript and REST.