COMS W4156: Preliminary Project Proposal

Team: Wall-E
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Project Name

LrnDeep

Synopsis

We aim to develop an interactive and straightforward method of building neural networks. Using our platform, generating functional deep-learning code is as easy as playing with Lego. Students and educators can utilize this platform to learn or teach deep learning in a simple, intuitive way. On the other hand, professionals can make use of this platform to visualize the structure of their neural nets, making it convenient to present their work to clients. Ultimately, we hope to avoid steep learning curves and make deep learning feasible for everyone.

In this platform, different layers of a neural network are represented visually by simple geometric shapes. Users can design their own neural networks by simply clicking and dragging, without having to deal with overly technical details. At the same time, the platform will generate code in real time that corresponds to the desired neural network. Users can easily update or modify a network in progress, and modifications will be visible both visually and also in the code generated. Furthermore, they can save their neural networks and restore their progress the next time they use our platform.

Language and Platform

Python 3 and Mac OS X

User Stories

1. As an instructor, I want to generate deep learning code in real time so that I can explain the code to my students. My conditions of satisfaction are: 1) code appears in real time when I drag a component onto the canvas; 2) related code is removed when I delete a component; 3) graph and code can be easily saved and restored in order to continue from a previous class.

2. As a student starting to learn deep learning, I want to familiarize myself with the process of building a deep neural network so that I can gain more understanding of the subject. My conditions of satisfaction are: 1) warnings are given when potential errors or points of confusion arise; 2) each step of the network building process is visualized in real time; 3) hints appear when hovering on components or canvas.

3. As a deep learning engineer, I am working in a team of a variety of backgrounds. I want to explain to my colleagues about the mechanism of neural networks so that they can quickly gain a direct impression of the tech parts. My conditions of satisfaction are: 1) different components of the neural network are represented in a straightforward way through different shapes and/or color; 2) the neural network graph can be saved as an image file for presenting to an audience.

Technologies

1. Github: version control
2. Apache Thrift: software framework
3. Unitest: python unit testing framework
4. Keras: python deep learning library
5. Pip: python package manager
6. Pickle: python object serialization
7. MongoDB: database program