Getting started with Theano

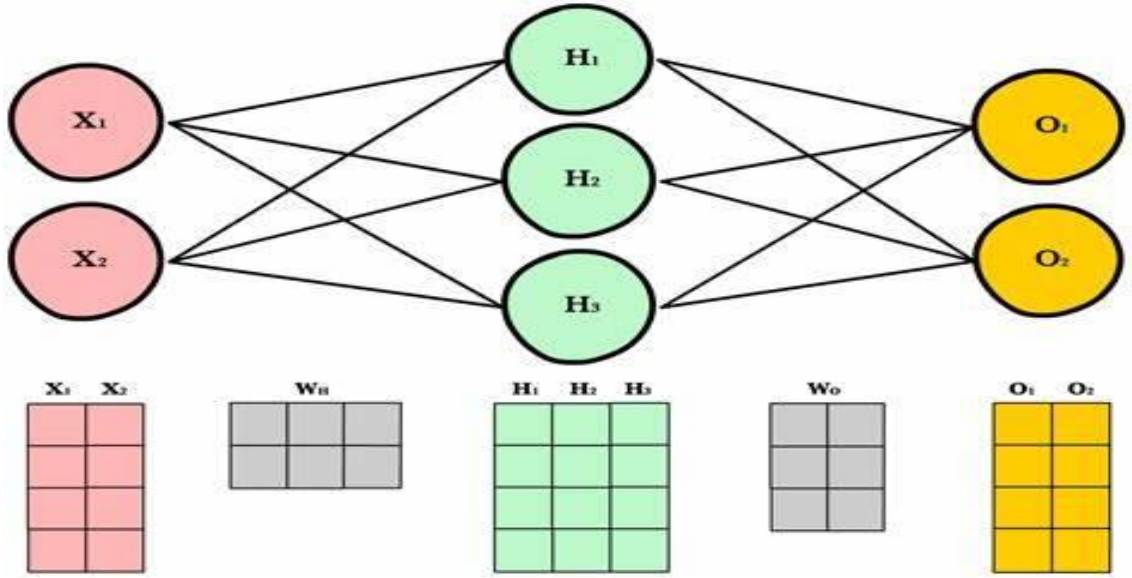
What is Theano?

- **Theano** is a Python library that allows us to evaluate mathematical operations including multi-dimensional arrays so efficiently. It is mostly used in building Deep Learning Projects. It works a way more faster on Graphics Processing Unit (GPU) rather than on CPU. Theano attains high speeds that gives a tough competition to C implementations for problems involving large amounts of data. It can take advantage of GPUs which makes it perform better than C on a CPU by considerable orders of magnitude under some certain circumstances. It knows how to take structures and convert them into very efficient code that uses numpy and some native libraries. It is mainly designed to handle the types of computation required for large neural network algorithms used in Deep Learning. That is why, it is a very popular library in the field of Deep Learning.

- Theano first builds the entire Computational Graph for your model. It then compiles it into highly efficient code by applying several optimization techniques on the graph. The compiled code is injected into Theano runtime by a special operation called **function** available in Theano. We execute this **function** repetitively to train a neural network. The training time is substantially reduced as compared to using pure Python coding or even a full C implementation.

Why to use Theano?

- Theano is a sort of hybrid between numpy and sympy, an attempt is made to combine the two into one powerful library. Some advantages of theano are as follows:
- **Stability Optimization:** Theano can find out some unstable expressions and can use more stable means to evaluate them
- **Execution Speed Optimization:** As mentioned earlier, theano can make use of recent GPUs and execute parts of expressions in your CPU or GPU, making it much faster than Python
- **Symbolic Differentiation:** Theano is smart enough to automatically create symbolic graphs for computing gradients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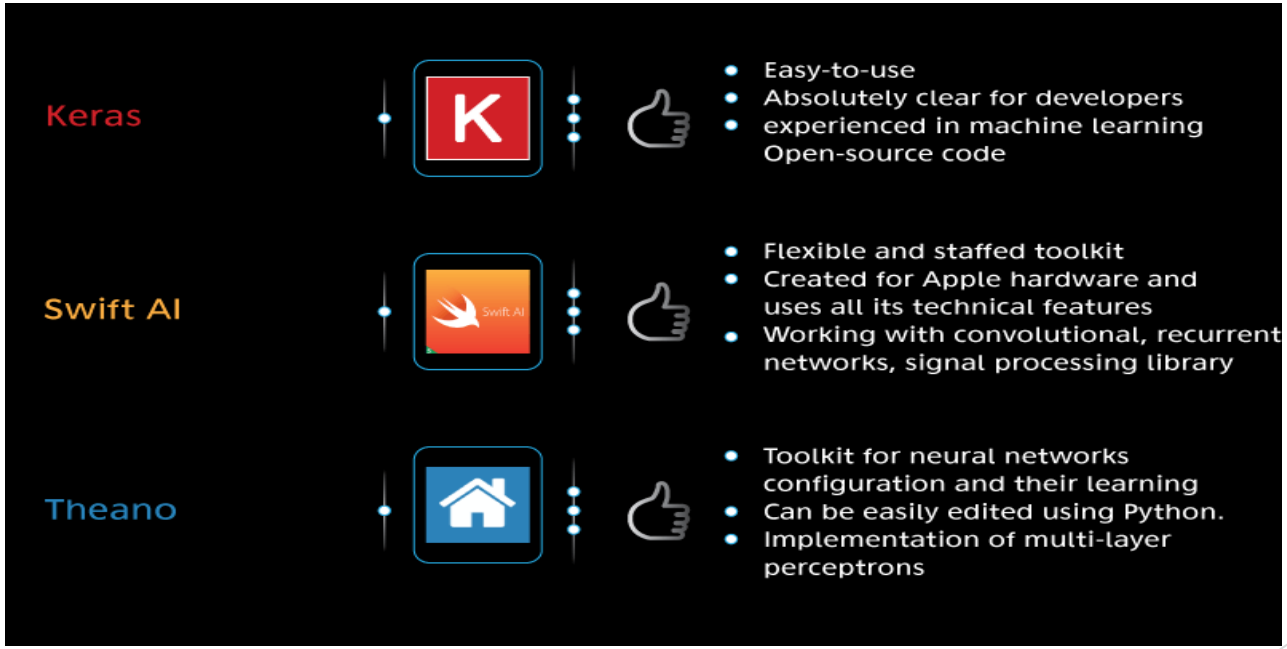
Keras
K
Easy-to-use
Absolutely clear for developers
experienced in machine learning
Open-source code
Swift AI
Swift AI
Flexible and staffed toolkit
Created for Apple hardware and uses all its technical features
Working with convolutional, recurrent networks, signal processing library
Theano
Toolkit for neural networks configuration and their learning
Can be easily edited using Python.
Implementation of multi-layer perceptrons

Resources and References

- Theano in Python – GeeksforGeeks
- Theano Tutorial (tutorialspoint.com)

Images:

- https://www.cleveroad.com/images/article-previews/Pics-AI-tools-4.png
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