# White Paper About Virtual Currency on Machine Learning Based on Block Chain

**Development Information**

Project Name: **DLC (Deep learning coin)** one kind of virtual currency that the coins issued according to the machine learning workload on the block chain network.

Language: Chinese && English

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**Guide and Introduction**

Block Chain and Machine Learning are the most popular and advanced technologies in the computer world these years. They are leading the Internet to a new era. But their using directions are still uncertain.

It is noticeable that Block Chain and Machine Learning are developing respectively in their own areas now. There seems to be no relationship between these two powerful technologies. My program is going to bring these two technologies together to melt the bright side of each and to make Block Chain more meaningful and Deep Learning more efficient. It will be a revolution in the computer software industry, whether for the area of virtual currency, deep learning, or distributed computing.

I have an idea to run machine learning on block chains to create a new type of coin, DLC (Deep Learning Coin).

I have created a repository for this project on github.com.

<https://github.com/devilyouwei/DLC>

**Thought and Background**

Nowadays, the world of block chains is full of various virtual currency. We have already known about Bitcoin, Ethereum, Litecoin and so on. But all of them take a lot of meaningless computation. The process of acquiring the bitcoin is called ‘mining’. Such a kind of work can only produce coins but can’t obtain any actual productivity. It is a waste of the time and the electric power just to get the results of meaningless decryption.

Now, we can’t wait to develop a type of valuable and meaningful virtual currency that its value equals the real productivity in the computer world. We try to use different devices to run the computation and train models for the machine learning. The achievements in the computing process will be considered as a proof of workload to create new coins. It sounds like bitcoin mining process, use workload to get reward and the reward is bitcoin. Actually, the principle is the same, exchanging workload for the rewards (coins). But the difference is if the workload can make actual valuable products (useful data or some models in the computer world). If such a block chain system can make valuable data or models, then the currency that issued by the system is reasonable.

**Purpose of the project**

The main purpose of this project is to make full use of the world’s spare devices so that we can reduce the computational complexity of central server or primary server. It’s just like cloud computing but something different. Cloud computing works on a special distributed network. This project, DLC, makes computing work on block chains. We can get rid of the one or some central computing devices (servers, PC, mobile, etc.) and throw the computing tasks in the DLC network. Make everyone in the DLC network be able to provide computing capability and make contributions to the DLC network.

Another important purpose is to create a totally different type of virtual currency that never does meaningless computing work, never inflation, never deflation, always equal to the value of workload, always free, always open to participants. Each user can submit the request for computation of machine learning in this block chain system, also everyone can join in it to provide computation for these requests.

**Example**

Here is a case to understand how DLC works. DMV needs such an app that can recognize the license plates by taking photos or uploading the existing photos to the app. The common way for DMV is to establish a technical team and hire developers related the field of machine learning. Then DMV purchases the powerful computers or servers for training the model. This way to develop the whole app costs much. Another way is to outsource the software to software companies and it will save a lot of money. But DMV still needs to pay for the later maintenance of the app.

With the DLC block chain network, DMV can just participate in it and submit all these requirements to DLC block chain in the form of delegating computing tasks. DMV doesn’t need to pay real money. In the whole process, the neural network of the model is continuously trained and perfected, also the equivalent virtual coins are being issued. The ownership of the final training result(model) will be for all the users who join in the computing. DMV has no ownership, only shared usage right. The coins that the users get is the proof of their workload.

In this case, how much data value is generated, how many coins is created. All the participants, whether publishers or calculators, benefit from it. And the neural networks in the whole block chain network will be developed better. This process is endless because the training of machine learning is infinitely close to correct.

**Noun definition**

DLC (Deep Learning Coin): one type of virtual currency, the currency is issued based on the training workload of the neural networks on the block chains.

DLCN (Deep Learning Coin Network): The block chain network for DLC, distributed network computing for machine learning. Works on this network.

Traditional Virtual Currency: such as Bitcoin, Litecoin, the coins are obtained by decrypting (large calculations) something meaningless.

Valuable Virtual Currency: the virtual coins are issued equal to the productivity in the block chain network, the productivity can be the trained model, some valuable data or calculation.

**Differences between traditional and valuable virtual currency**

Actually, there is no definition for valuable virtual currency. As the traditional virtual currency takes a lot of resource (computer performance) to decrypt meaningless character string,

I decide to make such a kind of virtual currency valued according to actual productivity in the block chain network.

So, the biggest difference is that traditional virtual currency is made for meaningless computation but the valuable currency should be created to equal with the value of products created in the network.

The traditional virtual currency solves the problem of inflation but doesn’t make out the problem of deflation. The coins, such as bitcoin, are limited issued, no more than 21 million. When the continuous improvement of productivity, the price of the product will fall and there will be fewer currencies in circulation. Finally, the limited coins can only reduce the smallest units to exchange the cheaper and cheaper goods.

To sum up, DLC will become the general equivalent of virtual world.

**What’s next?**

To develop a block chain is not something difficult, also machine learning techniques and documentation are mature. But how to make machine learning on block chain network has never been thought of. Before we start to implement the project, many problems and difficulties need to be solved. Here are some known questions we need to consider.

1. The training of the machine learning needs to be divided to blocks. What is the basis of dividing? Or what is the basic rule or unit of dividing.
2. DLC block chain network needs rewards to the participants. How to determine the rules of reward, that is, the conversion relationship between the amount of computation and the virtual currency.
3. How many block chains we need? DLC need to provide distributed computing as well as accounting. Obviously, we need more than one block chain.
4. The users in DLC are the participants of computation, DLC needs to allocate them the blocks of computation. So how to allocate these computing blocks to the users, such as one-to-one, one-to-some, some-to-some?
5. The users are also the publishers of the computing task. DLC needs rules to allow publishers to submit their computing tasks or we call it computing models in machine learning fields.
6. The information that DLC need to save
7. How to make balance between sharing and confidentiality