TESRA SUPERNET

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Tesra Supernet White Paper

Building Artificial Intelligence Super Brain

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Chapter 1 Abstract

Artificial intelligence has entered the blooming decade following the rapid development of deep learning and big data technology. Coming with it are technologies such as autopilot, speech recognition, and image recognition that will soon be admitted into million households. According to public information, intelligence research and consultation arrangement, the scale of artificial intelligence industry has exceeded 15 billion U.S. dollars in 2017. It is estimated that by 2019, the figure will exceed 34 billion U.S. dollars as such high-speed growth continues.

With the rapid development of the industry, we realize that both small and medium-sized enterprises and scientific research institutions will face the bottleneck of the shortage of computing resources. In the ordinary course of events, they will use 10-30% of the company's budget for hardware investment and maintenance such as GPU, which in turn limits R&D. Input.

The Tesra Supernet proposes a solution for building GPU supercomputer networks based on blockchains. GPUs distributed around the world are linked by blockchains, including GPU computing hardware and GPU mines of SMEs, forming a supercomputer network that serves artificial intelligence, thereby significantly reducing the hardware investment of artificial intelligence companies.

With the Tesra Supernet, companies can develop artificial intelligence that can run on GPU nodes around the world. Companies only need to pay for the cost of the task, thus significantly reducing hardware input costs. According to the price of Tencent Cloud, every TFlops GPU computing is worth 0.09dollars, and GPU Mining Farm average reward is 0.01dollars every TFlops. But according to reconstructive computing loss, the GPU Mining Farm average reward needs to be revised. So throughout convert, the final price is 0.02dollars every TFlops. To conclude it can save even 70% lower than the cost of traditional cloud computing services. As the burden on the company has been greatly reduced, the promotion and application of the Tesra Supernet will promote the innovation and development of the artificial intelligence enterprise in the entire society.

Tesra supernet can flexibly adjust the supply of GPU resources according to user needs, and more flexibly meet the needs of user development. For GPU owners, the sharing of the computing power also brings extra incomes, thus effectively utilizing the original hardware investment. For GPU owners, running Tesra supernet on the basis of the original mining operations can simultaneously extract multiple currencies and increase revenue. Tesra Tokens will be used as payment currency for the Tesra system.

1.1 Problems Faced by Artificial Intelligence Enterprises

The development of artificial intelligence depends on three major elements: algorithms, big data, and computing resources. In the development of artificial intelligence products, in order to achieve better product indicators, a large amount of data is needed to train the neural network, and this process requires a lot of computing resources and time, such as one month or even several months. Once a power outage or other failure occurs halfway through, the entire training needs to be repeated, which is extremely detrimental to the product's iterative update. To shortening the iteration cycle of artificial intelligence products, SMEs have to spend millions of dollars to buy computing resources.

The traditional computing hardware investment is also facing the problem of insufficient flexibility. Enterprises often use less computing resources in their early development, but as the data volume increases, the computing needs will continue to change. If the original equipment cannot meet the calculation requirements, purchasing the computing equipment repeatedly will cause the resources to be idle.

1.2 Introduction to Tesra Supernet

We have developed a distributed, blockchain-based supercomputer network, providing AI developers with low-cost, flexible computing services. The compute nodes in the network can be GPU servers of SMBs, and can also be idle GPUs in

GPU mines or even in personal computers. The calculation node with Tesra miner program will obtain the reward according to the actual task amount contribution, and the blockchain will complete the calculation and distribution of the entire reward.

AI supercomputer network consist of GPU resources scattered throughout the country provides powerful computing support for artificial intelligence research and development. This will make the Tesra Supernet the next-generation computing platform for the artificial intelligence industry.

Chapter 2 Tesra Supernet Design

2.1 Design Principles

In the design of next-generation supercomputer network platform that based on blockchain, we mainly consider the following principles:

1. Stability: The AI calculation process should not be interrupted arbitrarily and needs to avoid the loss of users and GPU suppliers.
2. Scalability: Computing services can be provided by one, ten, or even 1,000 GPU devices. The computing resources should be flexibly scheduled according to user requirements.
3. Privacy: Whether it is a miner, a user, or an operator, data privacy protection is required during use.

2.2 Project Advantages

2.2.1. The Tesra Supernet can directly reduce the high cost of enterprise computing resources. According to the price of Tencent Cloud, every TFlops GPU computing is worth 0.09dollars, and GPU Mining Farm average reward is 0.01dollars every TFlops. But according to reconstructive computing loss, the GPU Mining Farm average reward needs to be revised. So throughout convert, the final price is 0.02dollars every TFlops. In sum up, it can save 70% of the company's computing costs.

2.2.2. Based on CUDA parallel computing technology can make it easier for mainstream developers of deep neural networks to get started and obtain computing services more quickly.

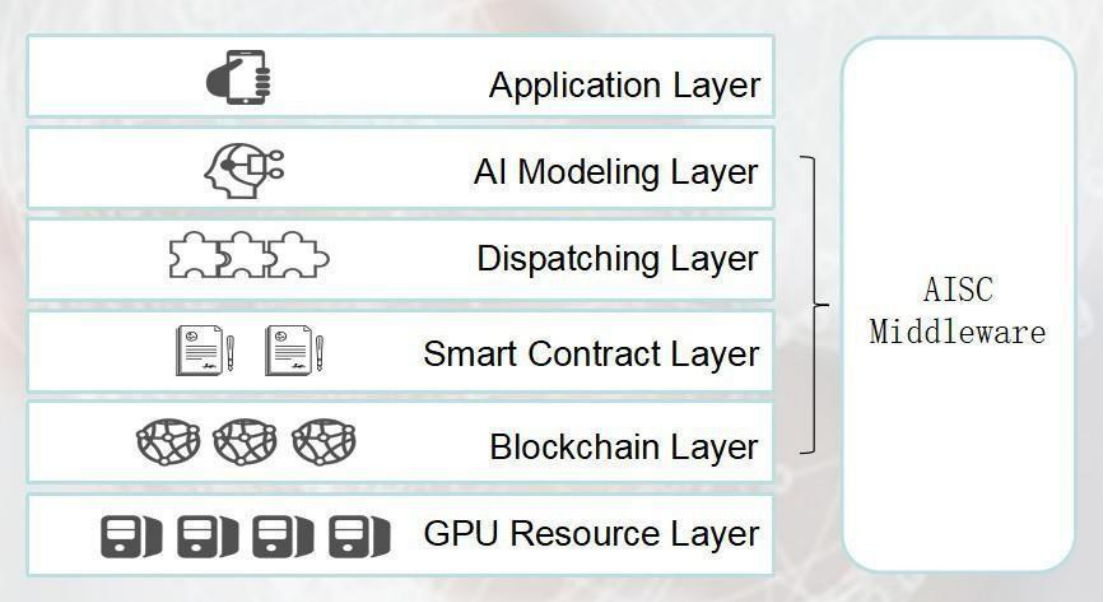
2.2.3. The node auto-optimization function will filter high-quality nodes and perform automatic load matching on computing tasks to meet the stability and elasticity requirements of user tasks.

2.2.4. After the line on main network, the Tesra Supernet will also provide a trading platform for user-defined datasets and algorithm models to create a complete supernet ecology.

2.2.5. The Tesra Supernet has a broad and deep industry application prospects, such as big data cleaning, supply chain finance and other industries. We have established a certain number of intended customers.

2.3 Blockchain Protocol

Tesra Supernet adopts an architecture consisting of multi-layer chains, with the bottom layer being the computation link layer and the upper layer being the data link layer. The computation layer is in charge of basic functions such as the scheduling and computing of tasks while the latter is a payment system responsible for the recording and transfer of data assets. We search in the market for a proven public chain as our data layer (which will be used for early testing and development and later be transferred to the public chain of our own).



2.4 Overall Framework

The miner joins the network through installing Tesra Supernet softwares and becomes a compute node. The node will prove its capability by taking the challenges and win for itself the chances to acquire the computing tasks (including artificial intelligence algorithm models and training data), after which it will obtain token as rewards through blockchain

2.5 Distributed AI Computation Framework

As the deep learning model becomes increasingly complex, the parameters of the model become more and more, and the training data is often measured by the TB level. Since gradients and updated parameters are calculated in each round of calculation, after the magnitude of the parameters has risen to the order of 10 billion or more, the updated performance and training duration of the parameters are unacceptable. Therefore, we adopt a distributed deep learning training method.

SAIC uses a distributed computing cluster, Cluster is a collection of Jobs, and Job is a collection of Tasks. Cluster can be divided into multiple Jobs, Job refers to specific tasks, each Job contains multiple Task, such as parameter server (ps), worker, Parameter Server Job management parameters of the storage and update work. The Worker Job is to run ops.

2.6 Remote Client

Create a calculation graph on the client and establish an interactive session layer with the cluster. The code contains Session (). A client can be connected to multiple servers at the same time, and a server can also be connected to multiple clients.

2.7 Server

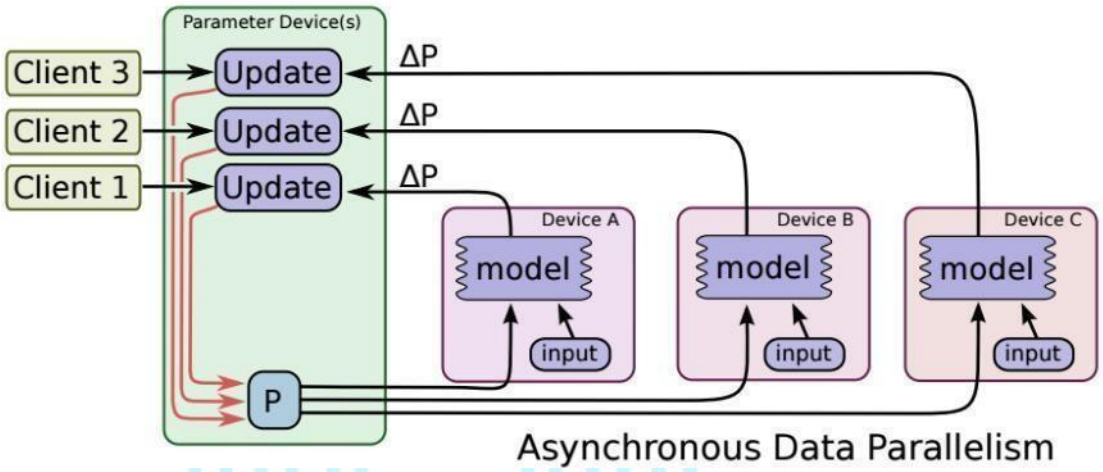
The server is created based on the user task requirements and executes the task cluster by running the train. Server instance process. There is a master service and a worker service. During operation, one master node process and several worker node processes, the master node process and the work node process communicate through the interface.

Distributed interactive order: Client -> Session Run -> Master Node Process -> Execute Submap 1 -> Work Node Process 1 -> GPU0, GPU1.

2.8 Asynchronous Gradient Update

Due to the large number of data training artificial intelligence tasks targeted by the Tesra supercomputer network, all operations use asynchronous gradient updates. The ps

server begins the parameter update directly as soon as it receives the gradient value of a machine, without waiting for other machines. With large amounts of training, parameters always tend to be optimal.



Multi-work node deployment. Multiple servers run multiple worker nodes. Set the CUDA_VISIBLE_DEVICES environment variable and start the process to add environment variables. Specify a specific GPU with device (). Multi-work node deployment can significantly increase the GPU usage of the miner.

Create a cluster and each task starts a service (work node service or master node service). Tasks can be distributed on different machines. Multiple tasks can be started on the same machine and run on different GPUs. Each task completes its work: Creates a train.ClusterSpec, describes all the tasks of the cluster, and describes the same content for all tasks. Create a train.Server, create a service, and run the corresponding job calculation task.

Distributed interface calls according to the above architecture are as follows. train.ClusterSpec({"ps":ps_hosts,"worker":worke_hosts}). Create cluster description information, ps, worker is the job name, and ps_phsts, worker_hosts are the node address information of the job task. train.ClusterSpec incoming parameters, job-to-task relationship mapping, mapping relationship tasks expressed by IP address and port number.

After the task is calculated, the task dispatcher returns the results and workload, and

cross-checks the workload data.

2.9 Compute Nodes

The compute nodes join the network and obtain computing tasks. The reception of computing tasks will start the VM, and build a computational event locally after analysis and compiling of the tasks. That finished, the computational events on the assigned compute nodes will form a small compute cluster.

Chapter 3 Mining and Privacy Protection

3.1 Mining Algorithm

Charges for training tasks: Users can select or customize models and select or upload data sets. The platform will perform deduction in real time according the actual operation of the task.

Task Collateral = Estimate Cost * Cost Range Parameter

The miner will pledge a portion of the token (Miner Collateral) in advance based on the amount of computational work, and then calculate and submit the results based on the amounts of tasks received. Once the task is completed, the task results will be evaluated and rewarded. The reward includes two parts, one is online reward, and the other is the actual task load. The actual task load will be adjusted based on the speed of operation.

Mining Reward = Task Price * Node Power / Sum of Task Power * Speed Bonus Rate * Comment Adjustment

3.2 Task Settlement

Miners' revenue comes from online rewards and user costs. Network rewards can be construed as a linear function that fluctuates according to the computing power utilization in the network. It includes there parts: block production rewards and challenge-taking rewards, and the first one is set to encourage the miners. For the former, Its purpose is to encourage miners to actively produce blocks.

The latter is to encourage all the nodes to prove their abilities (cheat-proof) and give them corresponding rewards in the light of the performance. The user's payment cost comes directly from the actual task workload. This part will be divided into two parts, part of which will be rewarded to each miner, and the other part (less than 5%) will be subsidized to a third-party operating platform (authorized by Singapore SAIC foundation). The latter will be responsible for part of the platform operations and payment gateways. Responsibility. Since the deposit paid by the user is higher than the actual task workload, the excess deposit portion will be returned to the payment wallet after the mission is completed.

Task Payment = Ta (Task Price * Node Power / Sum of Task Power * Speed Bonus Rate * Comment Adjustment)

Collateral Return = Task Collateral - Task Payment

3.3 Task Evaluation

If the miner's mission is completed within the expected time, it will be positively evaluated and reflected in the future reward parameter, the Comment Adjustment. If the task terminates abnormally, the disposition is as follows.

3.4 Task Exception Handling

If the miner aborts during the task calculation process, the miner will lose the Miner Collateral (Tesra Tokens miner deposit to ensure computing stability and performance) and reduce the Compensation Adjustment within the next 3 days. Abnormally terminated tasks will not charge user fees. The user will receive a task exception and return the user's deposit (User Collateral). Lost Miner Collateral will be used to make up for other miners who have been affected by the abnormal termination.

If the miner does not complete the task calculation punctually, the miner will lose the Miner Collateral and reduce the Compensation Adjustment in the next 10 days. Because failed node or low performance node will delay the task completion time of other normal nodes. The task will be forcibly terminated. Abnormally terminated tasks will not be charged user fees. The user will receive a task exception and return

the user's deposit (User Collateral). Confiscated Miner Collateral will be used to make up for other miners who have been affected by the abnormal termination.

3.5 User Cost

And user fees will through internal trading market be paid. The fee paid by the user is calculated based on the duration of the calculation task, the number of calculation units called, and the storage space. The actual charge can be dynamically adjusted according to the market price, but the cost will not fluctuate with the change of the currency price.

3.6 Data Privacy Protection

The data set submitted by the user during model training will be protected by privacy. The data set is distributed in the transmission process. Each data packet will be encrypted and point to point transmission is not transfer data set itself but the Hash value. At the same time, the data set will be cut and encrypted separately according to the size of the task. And when the computing is finished, the data set will be deleted automatically. Therefore, the miner will not be able to extract data singlehandedly or distribution it.

3.7 Recording Data Assets on Chain

When there is asset transfer happening in the system, the network will initiate a verification on the event, after which it will communicate with the data link layer and ask the latter to record and react accordingly.

Chapter 4 Independent Chain

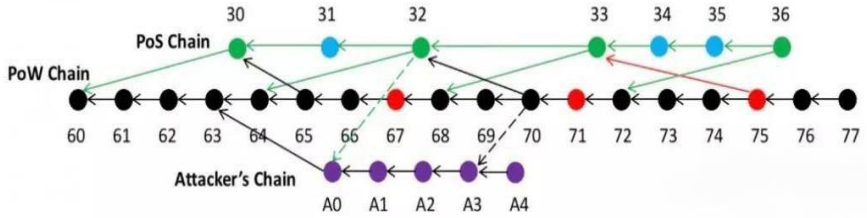
4.1 Innovation

4.1.1 Adopt PoVC consensus

Tesra Supernet adopts PoVC algorithm as its consensus, integrating PoW and PoS as in ethereum and bitcoin and upgrading mechanism on that basis. PoW is used to

generate and distribute Tesra coins. Tesra Supernet has a constant total of 10 billion and uses PoW for its mining, just like bitcoin mining. The bitcoin network has operated for nearly a decade without major bugs happening, proving its PoW consensus and the economic model based on it more stable than others.

The PoS consensus is used to pack transactions on Tesra, making the processing faster and the production and packing on Tesra more secure. 51% attack caused by concentrated computing powe will only affect the subsequent generation of Tesra Supernet. Assets of user accounts are therefore secured as it cannot affect transaction history.



4.1.2 Support lightning network, quick payment

The lightning network functions to keep off-chain transactions secured while it stays clear of any assets, which are stored in the network. The lightning network only works to make signature for transactions more convenient and quick.

The lightning network has two core parts, RSMC and HTLC. The former guarantees off-chain transactions between users while the later guarantees transfer between users can be done through one payment channel. The lightning network is a combination of the two ways that enables any two users to complete transactions off chain.

Tesra Supernet is planning to make lightning network possible, featuring functions like quick payment and immediate collection in the future.

A two-layered network is built for confirmation of transactions on Tesra Supernet, paired with changes to the internet communication protocol to reduce the time used for block confirmation. The normal two-layered confirmation network refers to a combination of PoS nodes (also refered to as normal nodes) and master nodes (including super nodes) while on the one hand, the former is responsible for packing transactions and broadcasting to the super node and others that are linked to the master node, the super node, on the other hand, resembles CDN nodes in the traditional internet and is responsible for data synchronization without any other

privileges on consensus. If the client chooses InstantSend model for real-time transfer, the inputs will be locked to a specified transaction, and the transaction will reach the consensus on master node network which will fail all transactions or blocks that don't conform to the consensus unless they correctly match with the ID for the locked transaction. As it takes about 1 second to lock transactions at present, we use InstantSend to guarantee safe transactions within one second, which we also call arrival in a second.

As regards the changes to the Internet communication protocol, Tesra Supernet has managed to quicken the information transmission on network, and help break some restrictions on cross-border transmissions to solve the problems of payment between countries under complicated web environment. To name the details, this is achieved by alterations to the protocol stack, making it possible for the normal nodes to exchange information rapidly under the protocol of the master node, which has a higher requirement for the internet environment where the super node exists.

4.1.3 Support anonymous transactions and Zero—knowledge proof Zero—knowledge proof denotes proving legal ownership of some rights while not disclosing relevant information—no knowledge exposed to others. Anonymous transactions are allowed to protect data on Tesra. One's data owned solely by himself are secured being used or exchanged.

4.1.4 Insufficient AI computing resources solutions

Based on blockchain technology, Tesra Supernet has developed a distributed super computing network that provides AI developers with economical and expandable computing services. The compute nodes in the network can be GPU servers of SMEs, GPU mines or even idle GPU from personal computers. The compute nodes acquire rewards according to the actual contributions made through task execution and the rewards will be calculated and distributed by Tesra Supernet.

Tesra Supernet will serve as a platform of new generation by integrating global GPU resources for the formation of a AI super computing network to offer powerful support to AI R&D with computing services.

Chain-based Tesra Supernet is in nature a DAPP achieved by applying smart contract and a platform where deep learning is available on chain. In this way the traditional real economy is better served by blockchain.

4.2 Model Structure: Multi-layered Network

4.2.1 Ecological structure

There are three layers in the ecological structure of Tesra Supernet specified as follows:

4.2.1.1 Application Layer

Support the development of programmable distributed applications; use smart contract for the registration, destruction and transactions of assets.

4.2.1.2 Protocol Layer

Account system, contract code supported, permit-free public chain, PoVC consensus.

4.2.1.3 Resources Layer

GPU provider, accounts keeping miner, etc.

4.2.2 Network Structure

Adopt a three-layered network structure—master node+POS light node+POW compute node， paired with distributed storage to make the whole network more stable, elastic and more aligned with the features of computing tasks.

4.2.2.1 Master Node Acceleration Layer

The master node is responsible for block broadcast and the allocation and scheduling of computing tasks. It does not play a part in block production and calculation, therefore making transactions faster (similar to the CDN server).

At each master node, a certain amount of coin needs to be pledged for trust. When the Master node malfunctions, it will be driven out of the network and the coins will be forfeited. Each Master node will receive a reward after the block is produced.

4.2.2.2 PoS Node Account Keeping Layer

Each POS node must be kept online as much as possible for equity accumulation. All

POS nodes are only responsible for packing transactions and producing block. Each node that produces block successfully will receive a reward.

4.2.2.3 PoW Node Computation Layer

The POW compute node is responsible for the production and distribution of tokens. During POW mining, nodes that succeed in the block production will be rewarded. During POS+POW mining, nodes that successfully complete the proof of work before the block production will be rewarded.

4.3 Master Control Program and Digital Structure

4.3.1 Transaction

Transactions on Tesra Supernet resemble traditional blockchain transactions—are transfer record from one account to another.

4.3.2 Task

Tesra SuperNet seeks to serve artificial intelligence and endorse the value of the computing power in the era of AI. In addition to financial services, Tesra SuperNet also provides computing services. The task is a combination of a series of calculations that consume computing resources.

4.3.3 PoVC Consensus

We adopt PoVC— an innovative decentralized consensus algorithm , in which we select block producers based on the updated “POS” and distribute coins through improved “POW”.

4.3.3.1 Block Production Mechanism

The improved "POS" algorithm in POVC allows blocks to be generated every 60 seconds, and only one "POS light node" is authorized to generate blocks anytime anywhere.

Each "POS light node" obtains equity by pledging coins as collateral. The equity only represents the probability that the node will obtain the block production right. The proof formula is: equity * target value > ProofHash. The greater the equity is,

the bigger the probability is of getting the right to produce block.

4.3.3.2 POW

POVC (initial stage of coin distribution) uses the CN2 algorithm to prevent the impacts of GPU and professional mining graphics cards and to guarantee fairness. The variant CryotoRight algorithm will be used later.

Deep learning is the foundation of artificial intelligence development, and the major work of deep learning is to perform matrix operations. Based on this, CryotoRight proves the computing power of nodes by strengthening matrix operations, thereby eliminating nodes that do not meet the rules of deep learning.

proof of computing power is as follows：

We need to solve the equation: $x^2 - dy^2 = 1$, which must have infinite positive integers for its solutions.

Suppose(x_0, y_0) is a solution for $x^2 - dy^2 = 1$ and the minimum positive integer as the solution for $x + \sqrt{d}y$, then all its positive integers as solutions are listed as follows:

x_n=1/2[(x_1+y_1d^0.5)^n+(x_1-y_1d^0.5)^n]

y_n=1/(2d^0.5)[(x_1+y_1d^0.5)^n-(x_1-y_1d^0.5)^n]

∴x_n+y_n*(d)^0.5$x^2 - dy^2 = 1$n fulfills linear recursion relations

x_n=2x_1x_(n-1)-x_(n-2)

y_n=2x_1y_(n-1)-y_(n-2)

Proof of the solutions:

First we need to prove there are infinite positive integers p, q that acts as solutions for $\left|\frac{p}{q} - \sqrt{D}\right| < \frac{1}{q^2}$ .Suppose $\sqrt{D} = \alpha$ in $\{p\alpha - [p\alpha] | p \in Z\}$, any positive integer Q>1 , there is $0 \le p_1 < p_2 \le Q$ conforming to $|(p_1\alpha - [p_1\alpha]) - (p_2\alpha - [p_2\alpha])| < \frac{1}{Q}$ (In fact, every arity in this set is between(0,1).

Given the intervals $[0, \frac{1}{Q})$ 、 $[\frac{1}{Q}, \frac{2}{Q})$ 、 … 、 $[\frac{Q-1}{Q}, 1)$, then when p=0-Q

(according to drawer principle), we have $|[p_1\alpha]-[p_2\alpha]-(p_1-p_2)\alpha|<\frac{1}{Q}$, namely $\left|\frac{[p_1\alpha]-[p_2\alpha]}{p_1-p_2}-\alpha\right|<\frac{1}{(p_1-p_2)Q}<\frac{1}{(p_1-p_2)^2}$. If Q = all positive integers(from the min to the max), we can get an infinite number of positive integers (p,q). End of the proof.

Next,for the previous p,q

We have $\frac{p}{q}<\sqrt{D}+\frac{1}{q^2}$,then $|p^2-Dq^2|=q^2\left(\frac{p}{q}+\sqrt{D}\right)\left|\frac{p}{q}-\sqrt{D}\right|<\frac{1}{q^2}+2\sqrt{D}$, which means p^2-Dq^2 only have finite positive integers, therefore there must be k making $x^2-Dy^2=k$ have infinite solutions.

For the above-mentioned infinite (x,y), according to Drawer principle, there must be (x_1,y_1) and (x_2,y_2) that satisfy $x_1\equiv x_2\,(mod\ k)$, $y_1\equiv y_2\,(mod\ k)$. Consider $\frac{x_2+y_2\sqrt{D}}{x_1+y_1\sqrt{D}}=\frac{x_1x_2-y_1y_2D}{k}+\frac{x_1y_2-x_2y_1}{k}\sqrt{D}$ and $\frac{x_2-y_2\sqrt{D}}{x_1-y_1\sqrt{D}}=\frac{x_1x_2-y_1y_2D}{k}-\frac{x_1y_2-x_2y_1}{k}\sqrt{D}$, by multiplying the to two formulas we have $\left(\frac{x_1x_2-y_1y_2D}{k}\right)^2-D\left(\frac{x_1y_2-x_2y_1}{k}\right)^2=1$ due to Congruence relation, $\frac{x_1y_2-x_2y_1}{k}$ is an integer, because (x_1,y_1) is different from (x_2,y_2), then we can infer $\frac{x_1y_2-x_2y_1}{k}\neq 0$. So $\left(\frac{x_1x_2-y_1y_2D}{k},\frac{x_1y_2-x_2y_1}{k}\right)$ is a solution for the equation.

4.3.3.3 Transaction Confirmation

Tesra Supertnet builds a transaction confirmation network featuring a multi-layer structure. The “POS” light node broadcasts the block to the master node to speed up the confirmation after packing the block. A transaction confirmed by 6 blocks is thought to be a successful one.

4.3.3.4 Virtual Machine

Tesra SuperNet implements a virtual machine at the bottom to support smart contracts, so it has programmable features, and it is Turing-complete, compatible

with Ethereum smart contracts. The developer's learning cost is very low.

Tesra SuperNet is committed to building the base chain in the era of artificial intelligence. Developers can use the computing resources provided by Tesra Supernet to develop DAPPs related to computing power and artificial intelligence without the need to invest in hardware facilities.

4.4 Governance

4.4.1 Fair Distribution

Since the POS will cause unfair distribution, the improved POW algorithm will be used for initial Coin distribution. After a certain degree, the complete POVC algorithm will be applied.

4.4.2 Chain Forks

POS inevitably produces many forked chains. To prevent this, when a fork occurs, the compute node will only select the longest chain for mining, so that even if the POS miner continues to producing block on the forked chain, there is no point without compute node.

4.5 Applications

After the chain goes stable, global teams are able to release their projects of AI applications on the public chain. And all applications released based on this chain will have access to all computing resources, data and models on it. This chain will reflect the ecological situation and business direction in AI industry, helping achieve real sustainable development of the whole AI ecosystem.

Chapter 5 Tesra Token Distribution Rules

5.1 Release of Token

The total issuance volume is 10 billion, of which 66% is generated through mining. The total time of mining is 66 years. As AI computing capability is one of the key

elements of future artificial intelligence competitiveness, the market size and application value are huge, and the mining process is closely related to economic value. The Tesra system will gradually transform the traditional mining activities to serve the real economy.

With artificial intelligence entering various traditional industries in the future, as more and more users use the supercomputer network for artificial intelligence development, Tesra Token's circulation needs will be greatly improved, Tesra Token's application scenarios will continue to increase, and the value of a single Tesra Token will increase, thereby rapidly increasing the Tesra Token holder's income.

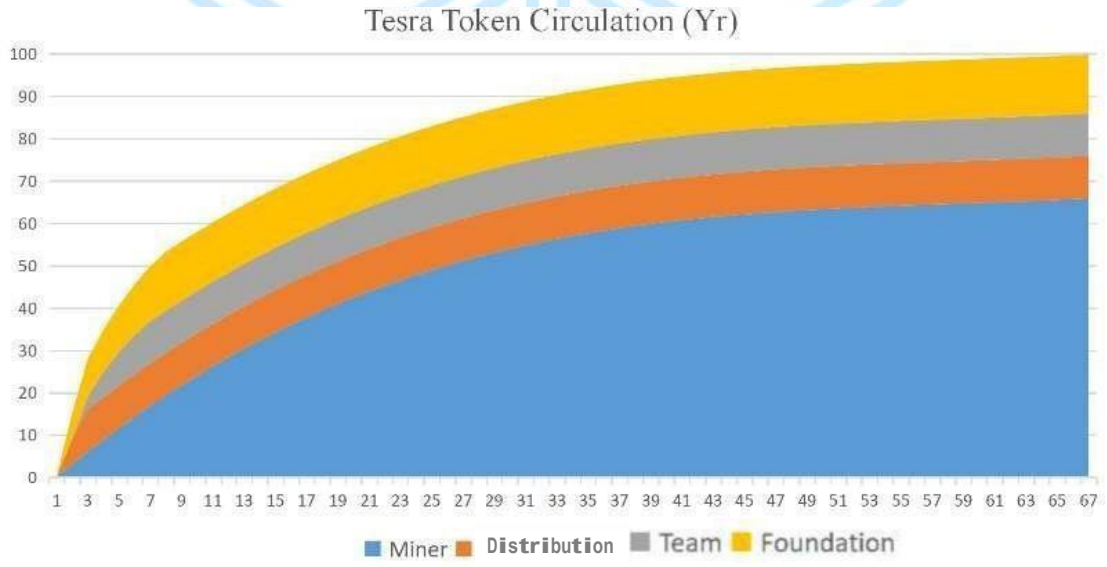
5.2 Token Distribution Table

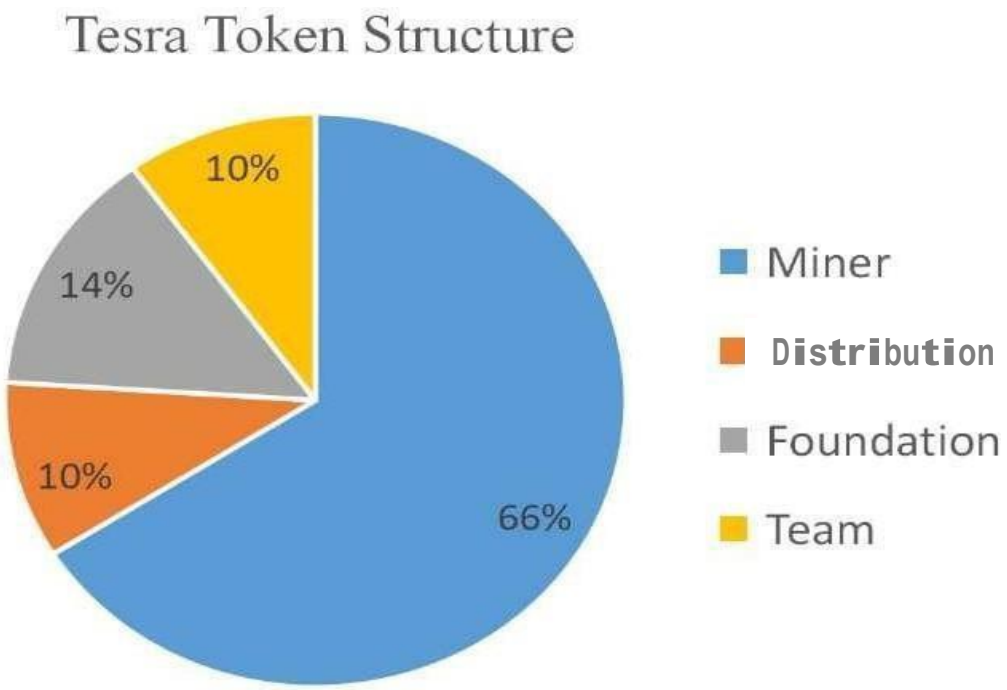
Mining: 66%, It will start after the line on main network.The mining period is based on the online test of the main network and the final economic model.

Foundation: 14%, including 9% for community nodes and commercial cooperation.

Team: 10%, 24 months lock-up period, released within 8 years.

Distribution: 10% ,distribute to the community based on the contributions of early computing resources providing.





5.3 Token Collateral Mechanism

Because large-scale AI operations take a long time, in order to ensure the stability of GPU computing services and avoid service interruptions in the middle, Tesra guarantees stable and reliable computing quality through a Tesra token collateral mechanism. GPU mining machines can also be mined without mortgage, but service capacity will be limited. Miners need to purchase from the market, or obtain from the Tesra ecological development, or use the Tesra tokens generated from the previous mining as a collateral for calculating the service quality, so as to obtain larger orders.

Since most Tesra tokens are produced through mining, but Tesra tokens needs to obtain Tesra tokens collateral. With the development of the project, the demand for Tesra tokens will increase.

5.4 Distribution Rules

There are two channels for token distribution, one is to select qualified investors to distribute token, the other is distribution to community contributors as rewards. The corresponding token amount will be distributed to the community based on the contributions

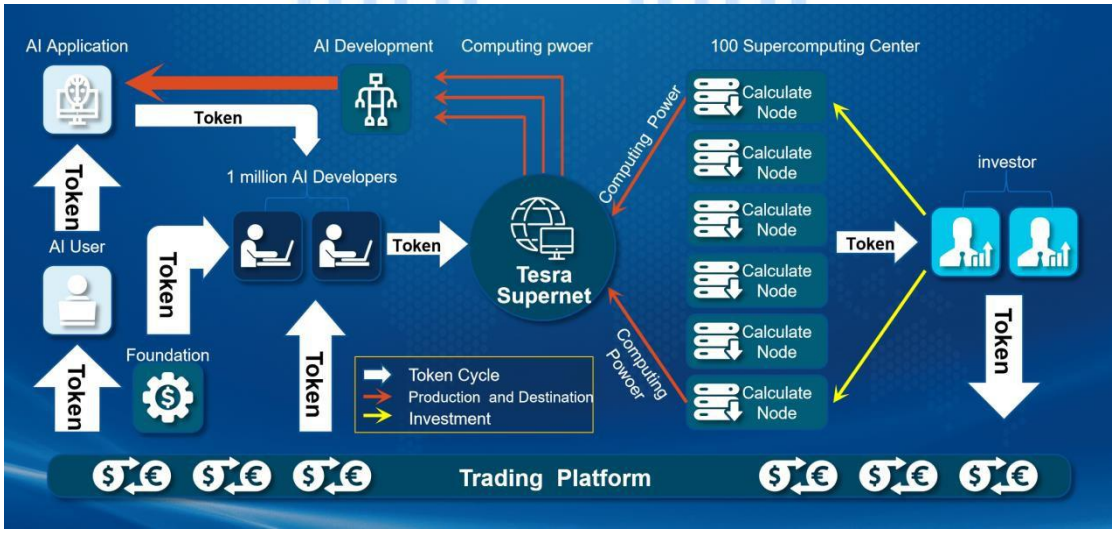
provided by the early computing resources. 70% of unsold token is used for mining plan and 30% becomes part of the fund to ecology construction. The specific transaction time will be disclosed by SAIC Foundation Pte.Ltd. .

5.5 Tesra Token Distribution Risk Control

In order to protect the interests of Tesra Token distributions participants, create a good and orderly market environment, and create valuable projects, mining will eventually produce a large part of the total supply. Investors, foundations, and team tokens will be locked in batches, and after the line on main network, these are released linearly according to the aforementioned lock-in period, the tokens obtained by the miners' mining need to be mortgaged in order to obtain greater income rights. There is no large amount of circulating stock for a considerable time, which greatly reduces the risk of participants in the asset listing.

Chater 6 Token Ecology

The token ecology of Tesra Supernet is an AI ecological cyclic development system, composed by technological construction, taken pricing, resource network and application ecology. (see pic for more details) A complete ecological structure has made the token ecology of Tesra considerably inclusive, expandable and self-adaptive as the whole ecology keeps self-cycling and updating.



The ever growing computing power resources will give birth to an AI industry with

market capitalization of thousand trillion in 10 years. Backed by the ownership and operation of computing power, Tesra is able to provide services for most of the AI applications and begin to build the data and model market gradually to form a complete AI ecology.

More resources are swarming in Tesra as its technology advances and network enlarges, keeping Tesra at the same pace with the most advanced technology in the world and making it an important role in the rising industry.

There are four factors constituting the token system of Tesra—Tesra Supernet the computing power renting platform, Siligence the technology community, Tesra AI Supernet Institute and Tesra Global AI Competition. As the token ecology continues to develop and expand, more ecological content will be created to propel the development of AI industry.

Chapter 7 Project Schedule

Prologue

Dec. 2017	Project team established
Mar. 2018	Proof of Concept
Jun. 2018	Private Beta completed
Aug. 2018	First AI computing center built
Sep. 2018	Release of public beta version
Oct. 2018	Launched on the Exchange
Dec. 2018	Token holders' addresses exceeded 20 thousands
Mar. 2019	Release of pre-commercial version
Apr. 2019	Implement the first global supercomputing centers
May. 2019	Launch on additional Exchanges

Wind

Jun. 2019	China AI Developers Competition
Sep. 2019	Cover 10 thousand developers

Epic

Dec. 2019	Decentralize the computing power dispatching system
March,2020	Main network to release small-sized mining nodes

Chapter 8 Use of Funds

The purpose of the public distribution is mainly to:

1. Build and consolidate the Tesra blockchain platform

By accelerating R&D, promotion and building the Tesra ecosystem, we will fast construct a SAIC blockchain platform, and optimize Tesra blockchain system performance, and promote marketing, and build domestic and international supercomputer networks, so that more manufacturers can understand and support the Tesra blockchain and the use of the Tesra tokens.

2. Use blockchain technology to create more valuable assets

Our goal is to use blockchain technology to redefine the artificial intelligence operating system, and believe that blockchain and artificial intelligence are in line with the project's technology and scale expectations for future development. Blockchain + artificial intelligence will change all aspects of our lives.

3. More effectively rewarding mining node contributors and token distributions supporters

As cooperation and demand increase, the difficulty of mining will increase and the value of money will increase rapidly. This will further stimulate the enthusiasm of mining node contributors and directly benefit currency holders. The project team will establish a SAIC industry chain fund for special public funds for token distributions, and gradually form a public disclosure mechanism, and promptly disclose the details of use.

Chapter 9 Technical Team

The following are some of the members of the project's joint development team, working with the Singapore SAIC Foundation rather than affiliated.

Satomi Taniguchi

Technology Partner of SAIC

AI Technology Specialist

Senior System Engineer, System Architect 20-year experience in global high-tech project management, Celebrated smart contract and blockchain course consultant, Long-term provider of technology consulting services for world-famous companies such as Hewlett, Packard, Japan Tobacco and Hitachi

Leo Lam

Technology Partner of SAIC

Asia Natural Gas Corp. Director of Communications Internet of Things Project has long been engaged in distributed storage and computing services and has eight years of experience in overseas communications Internet of Things.

Nan Hai

AI technical expert

Dr. Computer from Chongqing University, the founder of the Cloud Computing Association University App Development Alliance, and themember of the “Programmer” magazine (CSDN) expert group, has long been engaged in the application research of game artificial intelligence and machine learning.

Dan Yuanhong

Blockchain Engineer

Dr. Chen holds a Ph.D. in Control Theory Engineering from Chongqing University, and is responsible for the Intelligent Technology Laboratory of the University of Science and Technology. He is mainly engaged in the development and application of computer bottom technology.

Wu Genqiang

Cryptography engineer

Doctor of the Institute of Software, Chinese Academy of Sciences,mainly researches on the fields of cryptography and data privacy protection, major national science and technology major projects such as the "Nuclear High Base" operating system and Haiyun Collaborative Network Data Operating System and other major developers.

Tan Zhi

system engineer

Master of Automation in Chongqing University, formerly a solid high-tech R&D engineer, has long been engaged in the development of computer bottom layer technology and intelligent robot control chips

Zheng Yuqiong

Director of Legal Affairs

Former Financial Director of overseas listed company of Zhongshen Group, more than 20 years' experience in corporate finance and tax legal affairs management.

Lylian Li

Brand Director

Titanium Technologies Marketing Directo

former Greencom Group President Assistant and Brand Director

Chapter 10 Consultant

Yu Xueming professor

Doctor of Economics, Tsinghua University,Director of the Chinese society of management science,A specialist in enterprise management system of the State Ministry of industry and information State Tobacco Monopoly Bureau industry system standard Draftsman China aviation professional senior management system expert

Hou Wenjie

Ecological consultant

HKUST's vice director of the Southwest Region and the former Zhu Bajie Chief Executive.

Chapter 11 Voting and Community Governance

11.1 Operational issues

The Tesra project technical platform is carried out by the SAIC Foundation established in the Cayman Islands. The main task of the Foundation is to develop the Tesra technical platform in an open, fair, and transparent manner, without focusing on commercial profits. While Tesra blockchain and Token are operated by the SAIC Foundation Pte. Ltd. In Singapore. The profits earned by the Foundation will be reinvested in the further development. The Foundation is a legitimate organization that supports or participates in public or private interests without any commercial interest. The profit earned by the fund is called a surplus and reserves are used as funds for other activities without distributing profits to its members.

11.2 Governance Structure and Voting

To allow the Foundation to use its capital and resources in an open, fair, and transparent manner, to continue to promote the rapid development and growth of the Tesra blockchain platform, and attract more companies and organizations as participants in the Tesra blockchain ecosystem, the organizational structure which has been established by the Foundation is the following:

Board of Directors

The Board of Directors is the highest decision-making body of the Foundation and assumes the ultimate decision-making function. Members of the Board are responsible for reviewing and approving key issues such as strategic planning, annual plans, and budgets, and on behalf of the Foundation for voting on ecological issues of Tesra industrial chain. The members of the Board and the Chairman of the Foundation will be appointed for a two-year term.

Chief Executive Officer

The chief executive officer is appointed by the Board and is also the Chairman of the Board. The chief executive officer will fully implement the relevant decisions of the Board, will be responsible for the day-to- day operations, and report the implementation status to the Board on a regular basis. The chief executive has the right to set up necessary functional departments and recruit managers, who are responsible for coordinating five departments (technical research and development, product design and manufacturing, ecological management, marketing and finance personnel) form an organizational and management system centered on it.

Technical Research and Development (R&D) Committee

This committee is responsible for developing and auditing basic technology. It is the foundation of the Foundation. To ensure the smooth sharing of internal information, the R&D committee will exchange information with other committees (in particular the Product Design Committee), adjust the parameters of the Tesra blockchain platform and Tesra ecosystem over time, and determine the next stage of R&D.

Product Design Committee

This committee is responsible for enriching and improving the blockchain products offered on the Tesra blockchain platform, based on the R&D framework provided by the technical R&D committee. The committee is responsible for establishing sustainable concrete development strategies, conductingmarket research, coordinating product functions, and carrying out UI design and image design of the Tesra blockchain platform. Members will actively communicate with token holders and organize technical exchanges and other activities from time to time.

Ecosystem Development & Operations Committee

With the support of the other committees, this committee will be responsible for expanding the users and the network of the Tesra blockchain platform and will

actively explore and identify partners. The first aim is that the Tesra blockchain platform, the end users and the partners be closely linked to create an open and decentralized global privacy protection ecosystem. The second aim is to establish communities as part of the Tesra ecosystem and form a benign and interactive user community which will freely be able to share and access information.

Marketing Committee

This committee is responsible for the promotion of the core or derivative products and services offered on the Tesra blockchain platform. The duties of this committee include, but are not limited to, communication with the media, advertising, marketing design, and user interaction. The committee will work closely with the ecosystem development and operations committee to develop the most suitable publicity plan based on the requirements of partners and end users.

Finance Committee

The finance and personnel committe is responsible for managing the Foundation's financial and personnel affairs, such as fund management, accounting, and cost control. At the same time, due to the high risks presented by digital asset and blockchain projects, the committee will also be responsible for the risk management function and will cooperate with the other committees with respect to project management, financial risk analysis and evaluation. Due to the special nature of digital assets and tokens, audit systems are difficult to implement and monitor effectively. The Board of Directors will employ professional auditors with relevant experience to ensure the transparency and openness of the use of the tokens and the Tesra blockchain platform.

Chapter 12 Risk Disclosure

Systematic risks: refers to the possible changes on revenues caused by common global factors, which will impact revenues of all bonds in the same way (for example, policy risks). At present, it remains unclear how state is regulating blockchain projects and token distribution model financing, thus chances are participants will leave in the process. As regards market risk, if the overall value of the digital asset market is overestimated, the investment risk will increase; participants may expect growth on projects of token distribution while these high expectations may not be realized. At the same time, systematic risks also involves a series of irresistible factors, including but not limited to natural disasters, large-scale failures of global computer networks and political unrest.

Lack of oversight: digital assets transactions including Tesra token are highly uncertain due to the lack of oversight of the relevant field. At the same time, the tokens also face risks such as sudden surge, flop and manipulation by bankers. If someone inexperienced enter the market, he is likely to fall for the strike of assets and mental pressure brought by unstable market. Despite of the discreet suggestions on participation given by academic experts and media, no written form of regulations is found to date, making it hard to avoid the current risks.

Risk of oversight: It is undeniable that in the foreseeable future, relevant rules will be introduced to regulate the blockchain economy of the electronic token industry. Under supervision, the tokens purchased during the token distribution may be affected and suffer fluctuations or restriction in prices and market.

Risk of team management: There are currently many teams and projects in the blockchain technology field who are competing fiercely. On the premise of an intense competition in the market and the high pressure on project operation, whether Tesra industry chain can gain wide recognition through good practices still relies on not only its own ability and plans but also the exterior factors(opponent for example) and even the oligarch in the market. Vicious competition is possible.

In-house risk: The Tesra industry chain brings together a dynamic and powerful team that attracts senior blockchain experts, AI experts and experienced technology developers. As the pioneer in the field of artificial intelligence token distribution in China, the SAIC industry chain boasts the stability and cohesiveness for a team, which is vital to the overall development of the projects. However, in the future development, we should always note that it is impossible to rule out the possibility that the team will be negatively affected by the departure of core personnel and conflicts within the team.

Project Overall Planning and Marketing Risk: the Tesra Industry Chain project team will spare no efforts to achieve the development goals outlined in the white paper and expand the project's growth space. Because the white paper may be adjusted as the details of the project are updated, including content and plans, if the token distributor fails to get the details of the project updates in time, the loss of information may negatively affect the subsequent development of the project.

Project technical risk: first of all, the project is based on cryptographic algorithms, thus the rapid development of cryptography is bound to bring potential risks of being cracked. Second, while the blockchain, distributed ledger systems, decentralization, disagreement interventions, and other technologies support the development of core business, the Tesra industry chain team cannot fully guarantee the implementation of all technologies. Third, in the process of project updates and adjustment, there may be vulnerability that can be made up by release of patches, but the degree of impact caused by it is variable.

Hacker attacks and crimes: the number of individual supporters is very small in terms of security, but the total number is large, which puts high demands on the security of the project. Please note that electronic tokens are anonymous and difficult to track. They are easily exploited by criminals, attacked by hackers, or involved in the illegal transfer of assets.

Unknown risks: as the growth of blockchain technology and industry, SAIC industry chain might face some unexpected risks, which requires participants to fully understand the team background.

Unexpected risks may be encountered by Tesra industry chain. Therefore, the participants should be fully aware of the team background, the overall project framework and concepts so that it can adjust the expectations and be rational when collecting tokens before participation.

Chapter 13 Disclaimer

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