Smart Contracts

SUPERDAO

CATALOGUE

01 Introduction

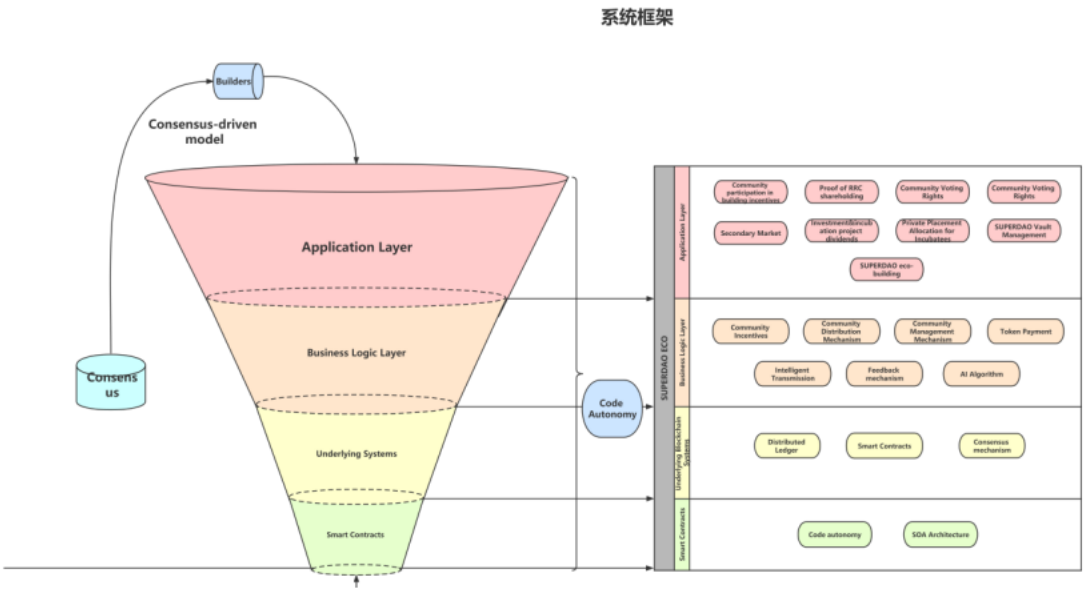
SUPERDAO smart contract is the cornerstone of the community to realize "voting resolution" and "code autonomy". It is the underlying code to protect community rights, interests and interests.

It runs in the Etheric chain and currency security chain, and the miners provide operational support. No user or group can change the code content, and the smart contract will operate according to the algorithm.

Smart contracts are the only operating standard for all activities in the community.Including community construction RRC distribution, community vault management, voting resolution, incubation projects, etc., therefore, the SUPERDAO has no centralized managers, only community members and voting rights, to ensure the community operation by all members jointly decided.

The underlying code of intelligent contract is composed of several intelligent modules, chain independent operation of Registry module, Job module, Agent module, GAN algorithm, quantitative analysis plate, TRB module, etc. Through the underlying algorithm, to ensure the security of community operation, including the TRB module maintenance and call the core algorithm, to ensure the stability of intelligent contract operation.

02 System Framework



The overall architecture of the SUPERDAO system adopts code autonomy and SOA architecture.

The basic module is the consensus mechanism, the smart contract, and the distributed ledger.

The business logic layer is the community incentive mechanism, community distribution mechanism, community management mechanism, token payment, intelligent transmission, feedback mechanism, and AI algorithm.

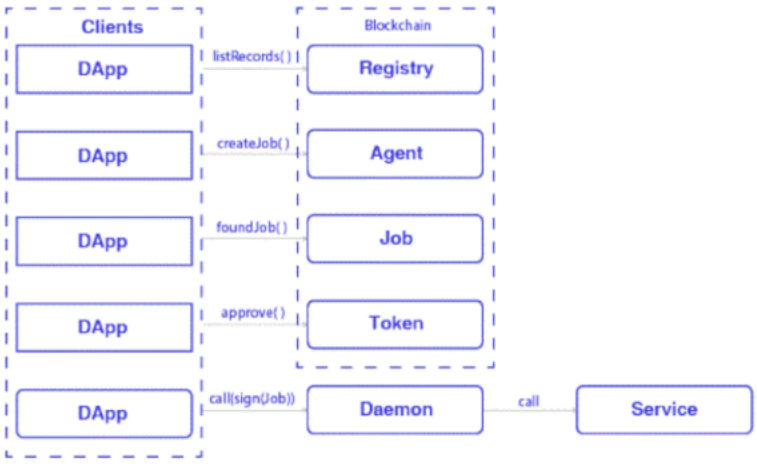
The application layer is business functional modules such as community participation in construction reward, RRC equity certificate, community voting rights, community voting rights, secondary market, investment / incubation project dividend, private equity quota allocation of

investment / incubation project, management of SUPERDAO vault management, SUPERDAO ecological construction, etc.

03 Smart contract module

SUPERDAO's user-oriented terminals are core blockchain-based modules. Its self-sustaining ecosystem encourages users to participate in community construction, community coffers and so on through various incentive mechanisms to gain revenue.

Based on this massive data, SUPERDAO and any other organization can register the trained AI model to the chain smart contract and provide the corresponding API description label for the intelligent module through the built-in API reservation mechanism, start the intelligent image guidance function, and then complete the pre-transaction of the microtoken (ERC20 protocol) with the required confidence authentication and record encryption function, and finally obtain the API call results.



Intelligent module launched the request of AI smart contract, first need to retrieve relevant services from the Registry according to the registration service list, determine relevant service information and use price, apply for service to Agent, Agent will be the user request as a queue processing, once the turn of the user, will create a new Job service, and prompt users need to pay to the service provider a certain token.After the user payment action, the server node will start the Daemon to run the specified Service and return the results to the intelligent module user.

3.1 The Registry module

That is, the "intelligent API certification intelligent contract", for the database storage, service ownership definition, out-of-chain metadata Functional services such as storage are completed with decentralized underlying blockchain technologies such as storage chains such as IPFS or SIA serve.

It serves as a fully open intelligent API interface, including three services:

3.1.1. Agency certification, the unified agency name of the AI service and classified storage database, the organization can be a single AI service developer, or a technology giant like Facebook and Google, and the agency members are managed by the owner of the registered address.

3.1.2. Service authentication,service classification name authentication including name, label, metadata characteristics of specific AI services, service is uniquely identified by a 160-bit address.The certification record of the service and its corresponding smart contract agent will interact with this service function.Services can be managed by the agency certified address owner (submission, modification, deletion, etc.).

3.1.3. Classified repository authentication. After a set of input and output data based on a certain classification is certified, it can be used for an AI service or shared between different AI services.With this design, it serves as the underlying shared element of the system, and allows the different AI services provided by different developers to interact and collaborate effectively.

3.2 The Job Module

namely "AI Hosting Service Smart Contract", this module provides a smart contract multi-hosting interaction system,Let the AI function tokens required to launch the AI service application and deliver the service be temporarily hosted to the multi-party chain by blockchain before the completion of performance and delivery.

It allows AI service providers to complete AI intelligent token prepayment between providers and customers outside the blockchain, and then complete real-time authentication delivery on the blockchain, eliminating the inefficient multi-loop repeated authentication of the current blockchain technology.

3.3 The Agent module

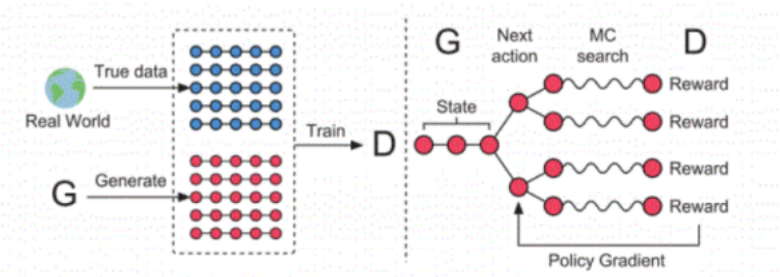
That is, "AI interface agent smart contract", docking with the smart contract interface design dedicated to external AI services.Through after enabling the arbitration agreement in advance, the end user can predict to connect with the final task settlement point of the AI service, and then can lock the price range of the relative connection service through the intelligent negotiation mechanism, so as to enable the docking service.

All the wide variety of AI services certified in the main network can advance their core value through this arbitration agreement, thus improving the utilization and docking success probability of AI services.And because of the use of the blockchain prepayment

mechanism, it can ensure that the mutual trust confirmation and task information encryption function is complete.

3.4 GAN algorithm

Based on the massive high-value data of users, combined with a large number of events in the market and the historical data of various blockchain asset prices, GAN algorithm and variant Sequence GAN are used to conduct AI analysis of all kinds of data, to provide API interface for intelligent module calling and execution.



The above figure is an example of the Sequance GAN model.

Left: D will obtain both real-world data and artificially generated data.

On the right: G has obtained the corresponding reward feedback according to the Monte Carlo search of D and completed the training.

The purpose of adversarial is for better generation, here the goal of generator G is to generate sequence to maximize reward expectations.

$$J(\theta) = \mathbb{E}[R_T|s_0, \theta] = \sum_{y_1 \in \mathcal{Y}} G_\theta(y_1|s_0) \cdot Q_{D_\phi}^{G_\theta}(s_0, y_1),$$

The desired generation formula is J ().It is, under the condition of s0 and, to produce some complete sequence.

The expectations of the reward.The G () part can be easily seen as the Generator Model.And the Q () (I call it the Q value here) is called a sequence action-value function in the text.Therefore, we can understand that the probability of generating a certain yl is multiplied by the Q value of this yl, so as to multiply the probability of all y, and then sum, we obtain this J (O), that is, the function that we generate the model wants to maximize.

$$Q_{D_\phi}^{G_\theta}(a = y_T, s = Y_{1:T-1}) = D_\phi(Y_{1:T}).$$

We then find the Q value with REINFORCEalgorithm and regard this ② value as a mirror.

Return value of the alias D.

Because the reward produced by incomplete trajectories has no practical significance, the resulting ② value of y_ 1 in the original y1 to y _ -1 cannot be calculated directly after y_t production, unless y1 is the last of the entire sequence.paper figured out a way to use Monte Carlo search (as far as I know "is equivalent to" random ") to complete yt content.Since it is arbitrary completion indicates that there are many situations, paper calculates reward for all possible sequence after the same y_ after Monte Carlo search completion, and then aver.As shown in the figure below.

$$Q_{D_\phi}^{G_\theta}(s = Y_{1:t-1}, a = y_t) =$$
$$\begin{cases} \frac{1}{N}\sum_{n=1}^{N} D_\phi(Y_{1:T}^n),\ Y_{1:T}^n \in \mathrm{MC}^{G_\beta}(Y_{1:t}; N) & \text{for} \quad t < T \\ D_\phi(Y_{1:t}) & \text{for} \quad t = T, \end{cases}$$

In this way, we have generated some realistic sequence s.We need to train the D as follows.

$$\min_{\phi} -\mathbb{E}_{Y\sim p_{\text{data}}}[\log D_\phi(Y)] - \mathbb{E}_{Y\sim G_\theta}[\log(1 - D_\phi(Y))].$$

D trained one or more rounds (because GAN training has been a problem, find G and D

The proportion of training rounds is key), you get a better D and use D to update G.

The G update can be seen as a gradient descent.

$$\theta \leftarrow \theta + \alpha_h \nabla_\theta J(\theta),$$

among

$$\nabla_\theta J(\theta) = \mathbb{E}_{Y_{1:t-1}\sim G_\theta}\Big[\sum_{y_t\in\mathcal{Y}} \nabla_\theta G_\theta(y_t|Y_{1:t-1}) \cdot Q^{G_\theta}_{D_\phi}(Y_{1:t-1}, y_t)\Big].$$

The h representation represents the learning rate.

Example Algorithm:

Algorithm 1 Sequence Generative Adversarial Nets

Require: generator policy G_θ; roll-out policy G_β; discriminator D_ϕ; a sequence dataset $\mathcal{S} = \{X_{1:T}\}$

Initialize G_θ, D_ϕ with random weights θ, ϕ.
Pre-train G_θ using MLE on $\mathcal{S}$
$\beta \leftarrow \theta$
Generate negative samples using G_θ for training D_ϕ
Pre-train D_ϕ via minimizing the cross entropy
repeat
  for g-steps **do**
    Generate a sequence $Y_{1:T} = (y_1, \ldots, y_T) \sim G_\theta$
    for t in $1 : T$ **do**
      Compute $Q(a = y_t; s = Y_{1:t-1})$ by Eq. (4)
    end for
    Update generator parameters via policy gradient Eq. (8)
  end for
  for d-steps **do**
    Use current G_θ to generate negative examples and combine with given positive examples $\mathcal{S}$
    Train discriminator D_ϕ for k epochs by Eq. (5)
  end for
  $\beta \leftarrow \theta$
until SeqGAN converges

The G network and the D network parameters were randomly initialized

first.

G trained via MLE to improve the search efficiency of G networks.

Some data was generated using the pre-trained G and was used to pre-train D by minimizing the cross-entropy.

1. Start generating the sequence and use equation (4) to calculate the rewad.

2. The secuerce generated by G and the Q values generated by D).

3.Update the parameters of G by using equation (8).

4. Better G generates better sequerce, and trains D with real equation (5) data.

The above 1,2,3 cycles trained until convergence.

3.5 Quantification and analysis plate

Quantitative analysis is based on large amounts of data that are mainly derived from community member voting submissions and built-in crawler modules.

In the face of massive daily information occurrence and audit submission in the community, intelligent contracts can get intelligent and quantitative analysis data, screen the data, and intercept the malicious submitted data, so as to prevent the phenomenon of agglomeration from affecting the development of the community.These analytical conclusions can screen and screen multi-dimensional and multi-angle related projects, help users to eliminate the false and save the true and

survival of the fittest, and also help the whole community to achieve healthy and rapid development.

The quantitative analysis section is equipped with a deep learning engine and GAN in NLP model processing.

Models, mainly used to determine the authenticity of events and messages, are released to members from a unique perspective of SUPERDAO.Through many practices, members have found that SUPERDAO's false authenticity is far higher than commentators or their own sources to form word of mouth communication and attract more users to become members.

SUPERDAO's powerful machine learning engine, a closed-loop mechanism between information, users and data, through collection, decision-making, feedback and correction, and it constantly improves the accuracy of prediction.In the deep learning engine part, SUPERDAO adopts the most popular GAN model in the field of artificial intelligence today.As a generative model, the most direct application of GAN is for the modeling and generation of real data distribution, including generating some images and videos, as well as generating some natural statements and music, etc.Because of the mechanism of internal strong adversarial training, GAN can solve some problems of insufficient data faced in traditional machine learning, so it can be applied in semi-supervised learning, unsupervised learning, multiperspective, multi-task learning, and reinforcement learning scenarios.

04 Community incentive plate

The incentive to the community is a core function of the SUPERDAO.The Community incentive is one of the ways for the members to obtain the RRC, and 25% of the total number is used for the community incentive, which is the main factor affecting the enthusiasm and activity of the community.By stimulating users to actively build the community, SUPERDAO strengthens the protection mechanism with the community interests as the core, and combines the artificial intelligence of GAN algorithm to provide an upward force for the community market value.
There are two roles in the community section, the community builder and the community participants.

Community builders

Users can create a community by initiating an application to complete information, and only one per community builder can create one With 10 communities and the only community name, community builders can issue internal announcements on the platform to recruit the community
Members can also publish external links across platforms to invite members to join the community.

Community participants

In the SUPERDAO community section, each user can only join one community at the same time, that is, as long as the user joins any community, if you want to join another community, the existing community must be withdrawn to operate.This design is designed to protect the rights and interests of users. Users can choose high-quality communities to join at will. If a community builder has no intention to join the community after inviting users to join the community, maintain and operate their own community.It could lose a lot of users soon.Such mechanisms also guarantee the quality of the communities within the platform.

Community rating

SUPERDAO divides the community into different grades: S / A / B / C, where C is the lowest and S is the highest. The grade is determined based on the sum of the number of RRC held by all users in the community, the more RRC held, the higher the grade of the community.

The number of communities at each level within SUPERDAO is constant, such as: S has only 10 places, when community 11th and 10th is downgraded to A, while 11th is upgraded to S because it has more RRC. Depending on the community level, the benefits of community builders and community participants will benefit accordingly.

Adjustment, the higher the community level, the less RRC the user consumes, and the RRC obtained through the contribution behavior The more, this will also affect the display effect of users participating in the community construction and the community vault.

Community level benefits

Community levels are different, and the proportion of all community users consuming and acquiring RRC within the SUPERDAO platform is different, and a higher community level will gain a higher advantage in these scenarios.

SUPERDAO provides many service tools for the community sector, which can greatly improve the efficiency of community operation and management, but community builders need to use RRC to buy tools. The higher the community level, the lower the discount on buying tools. We will greatly increase the benefits of early RRC investment, which also reduces users.

The threshold to use tools, while the gain gradually decreases as the hold increases.

$$R = P + log_c T$$

Among them, R is the bonus and consumption discount of users in specific communities, and P is the basic guarantee Value, c is the floating base, T is the amount the community holds RRC.

Community construction invitation incentives

Community members can obtain an RRC by inviting users to join the platform, when the higher the community level, the invitation

The higher the user gain, we set a threshold to prevent user conce ntration or user clustering,When the number of users reaches the th reshold, the revenue increase of inviting users to join the platform will decrease.

$$R = \sum_{k=1}^{n} (P + \frac{1}{\sqrt{2\pi}} e^{-\frac{k^2}{2}})$$

Among them, R is the total reward obtained from the invitation user, and P is the invitation basic reward, followed by a reward value distributed positive too much with the number of invitation Rk.

Return of the commission to the community builders.

Community builders can get community users consuming RRC rebates, weekly knot, and community within the platform.

The larger the total amount of users they consume, the higher the rebates the community builders get, which makes the community builders active.

Promote the functions of the platform, and will also produce a large number of products that can be used for user consumption, such as: live broadcast, training,

Event tickets, etc.

$$R = P + S^{\ln C}$$

Among them, R is the rebate value of the community builders, P is the basic reward for the rebate value, S is a rebate base, and C is the total amount of tokens consumed by the community.

05 Community Treasury investment, incubation plate

Community vault investment and incubation profit are an important part of the income of community members. The profits of the projects or community incubation projects within the resolution time, part of the projects will be retained in the community vault, and some part will be distributed to all RRC currency addresses through smart contracts.

By encouraging the community members to initiate the proposals and actively incubate the projects, the SUPERDAO strengthens the protection mechanism centered on the interests of the community vault, combined with the artificial intelligence of the GAN algorithm, to provide the guarantee mechanism to the community members.

The community vault is managed by smart contracts and can decide on the project process through a voting mechanism.

Income from dividends through smart contracts.

For smart contract project management, the specific business scenarios are as follows:

5.1. Based on artificial intelligence and big data technology, the system

forms the target based on the project data of the past one hour, and predicts the future direction of the project in an exchange.

5.2. Forecast according to the rules.

5.3. There must be the corresponding token hosting, accurate prediction, and the same number of system reward token. The prediction is inaccurate, and the token will automatically enter the reward pool.

For the information independently provided by the community users (UGC content), predict the user-initiated target.

The sponsor shall set up the corresponding contract by itself:
5.3.1. The initiator may set the prediction parameters, such as interval, currency value prediction.

5.3.2. The sponsor shall trust the token security deposit.The more the margin, the more attractive it may attract, and the number of tokens on the margin depends entirely on the information publisher.
4. Users will make predictions according to the rules.

5. The winner is determined according to the currency price.The margin of the wrong prediction person will enter the reward pool, and the correct forecast person will enjoy the income distribution according to the margin ratio.

Users are encouraged to initiate and participate in market market fo recasts based on all kinds of information, excluding all participation forecasts.

In addition to the user's margin, the system will provide the corresponding bonus amount for each prediction, and the final composition.

Total bonus pool.

$$T = P + S * (1 + R) + \sum_{k=1}^{n} C_k$$

Thus, each predicted total prize pool consists of three parts, the system randomly bonus bonus P.The system dynamically adjusts the additional bonus bonus S * (1 + R) according to the number of participants and the forecast deviation, plus the sum of the input amount of all the users participating in the forecast.Among them, P is a random number of the [10,50] interval. S will be dynamically adjusted with the number of participants. The more the number of participants, the more the bonus attached by the system. In order to avoid malicious brush amount, the bonus amount will have an upper limit.

Among them, S will be valued based on the range of the number of participants in the predicted betting:

$$S = \begin{cases} 20, & n > 0. \\ 200, & 20 \le n \le 50 \\ 500, & n > 50 \end{cases}$$

At the same time, in order to encourage users to objectively and accurately predict the market market and avoid low-quality prediction behavior, the prediction deviation value is introduced, from the prediction value P and the event occurrence value P.The absolute value of the difference and the event occurrence value P.The ratio of is calculated.The closer the predicted value is to the actual occurrence value of the predicted event, the higher the additional bonus of the system will be.

$$R = \frac{|P_a - P_v|}{P_a}$$

After the forecast event, the failed party will lose the margin into the total bonus pool, by forecast the correct party to distribute the total bonus pool according to the proportion of the investment margin.

$$R_n = T * \frac{P_n}{\sum_{k=1}^{n} P_k}$$

Among them, Rn is the gold awarded by users with the correct prediction, T is the total bonus pool, and Pk is correct.

The margin invested by the user is Pn, and the margin invested by a specific user.