STELLARAI (STAI) WHITE PAPER

Decentralized intelligent space infrastructure
integrating AI, Robotics, and SpaceTech



catalogue

1、Abstract 4-5

2、Era background and industry opportunities 6

2.1 The aerospace industry has entered a period of commercial explosion 6

2.2 AI technology becomes the core engine of aerospace intelligence 7

2.3 Robot technology extends from the ground to space 8

2.4 Decentralized technology reconstructs spatial collaboration paradigm 9-10

3、Industry pain points and existing challenges 11

3.1 The utilization rate of aerospace data is extremely low, and its value has not been fully explored 11

3.2 Mismatch of computing power supply and demand, and ineffective integration of distributed computing power 12

3.3 Fragmentation of robot services and lack of unified collaboration standards 13

3.4 The aerospace industry is closed, making it difficult for external innovation forces to enter 14

4、Project positioning and core value proposition ...15

4.1 Project Positioning 15

4.2 Three core value propositions 16

5、Core business modules and technical architecture 17

5.1 Distributed AI Computing Network Module 17

5.2 Satellite data analysis service module 18

5.3 Autonomous Robot Service Network Module 19-20
5.4 Intelligent space mission scheduling module 21
5.5 Technical architecture layering 22
6、Core competitive advantages of the project 23
6.1 Advantages of technology integration 23
6.2 Advantages of Data Closed Loop 24
6.3 The advantages of decentralization 25
6.4 Token incentive advantages 26
6.5 Narrative and Communication Advantages 27-28
7、Token Economy Model 29
7.1 Basic information of tokens 29
7.2 Token Core Utility 29
8、Ecological participation roles 30-31
9、Development roadmap planning 32
10、Risk statement 33
11、Conclusion 34

1. Abstract

StellarAI (token abbreviation: STAI) is a decentralized intelligent space infrastructure protocol that integrates artificial intelligence, robotics technology, and aerospace technology. The project is anchored on three main technological lines: autonomous robot systems, intelligent aerospace operations, and satellite data analysis. It is committed to integrating AI computing power, robot control capabilities, and spatial data resources through blockchain for unified scheduling, trusted settlement, and ecological collaboration.

The current aerospace industry is at a critical juncture of transitioning from "labor-intensive" to "intelligent autonomous". The exponential growth in the number of satellites, the increasing complexity of space missions, and the explosive increase in ground data have made it difficult for traditional manual control models to cope with the challenges of massive data processing and multi device collaboration. At the same time, AI big model, robot autonomous control, edge computing and other technologies have matured rapidly,

providing a technical base for the intelligent upgrading of the aerospace industry.

The core mission of StellarAI is to build an open and decentralized intelligent space collaboration network: to standardize the matching and settlement of the computing power requirements of ground and in orbit robots, satellite remote sensing data analysis tasks, AI model training and inference scheduling through smart contracts. As an ecological native function token, STAI undertakes multiple functions such as computing power payment, data trading, robot service invocation, ecological governance, and incentive allocation.

We believe that the deep integration of AI and aerospace technology will be the most imaginative technological wave of the next decade. StellarAI hopes to become a value infrastructure in this wave, allowing global developers, robot operators, data scientists, and aerospace enthusiasts to participate in the construction and sharing of the intelligent space ecosystem.

2. Historical background and industry opportunities

2.1 The aerospace industry enters a period of commercial explosion

The global commercial aerospace industry is experiencing unprecedented high-speed growth. The low Earth orbit satellite constellation accelerates networking, the number of remote sensing satellites continues to increase, reusable rocket technology gradually matures, and space payload costs have significantly decreased. Satellites have expanded from their previous single military and scientific research purposes to a vast range of commercial scenarios such as Earth observation, communication and navigation, the Internet of Things, meteorological monitoring, and ocean management.

However, the explosive growth in the number of satellites has also brought new operational challenges: the traditional single satellite control mode is inefficient, multi satellite collaborative task scheduling is complex, the amount of data received by ground stations is exponentially increasing, and manual interpretation and analysis are completely unable to cope. The

aerospace industry urgently needs an intelligent and automated operational system to manage the increasingly large 'space asset fleet'.

2.2 AI technology becomes the core engine of aerospace intelligence

Breakthroughs in artificial intelligence, particularly computer vision, big language modeling, reinforcement learning, and other technologies, are profoundly changing the way the aerospace industry operates

Satellite remote sensing intelligent interpretation: Traditional remote sensing data requires professional analysts to manually interpret, which is inefficient and time-consuming. AI image recognition models can automatically identify information such as surface changes, crop growth, water pollution, urban expansion, and disaster damage, improving data processing efficiency by several orders of magnitude.

Autonomous planning of satellite missions: Faced with massive observation targets and limited satellite transit

windows, AI can dynamically optimize task scheduling, automatically select the optimal observation sequence and shooting parameters, and maximize satellite utilization.

Autonomous diagnosis of in orbit anomalies: During the operation of satellites in orbit, a large amount of sensor data is generated, and AI can monitor equipment status in real time, warn of faults in advance, and reduce the cost of ground manual intervention.

Autonomous operation of space robots: Future in orbit services, debris cleaning, space station maintenance and other tasks highly rely on the autonomous perception and decision-making ability of robots, and AI is the core to achieve intelligent space robots.

2.3 Robot technology extends from the ground to space

Robot technology is gradually extending from industrial and service scenarios to extreme environments, such as space, deep sea, polar regions, and nuclear radiation zones, which are difficult for humans to directly operate in. These are precisely

the best application scenarios for robots.

On the ground side, inspection robots, agricultural robots, logistics drones, and unmanned inspection vehicles have begun to be deployed on a large scale; On the space side, in orbit robotic arms, lunar rovers, Mars probes, and space station maintenance robots are moving from laboratories to engineering applications. Behind these robot systems, powerful AI algorithms are needed as the 'brain', requiring massive computing power for training and reasoning.

2.4 Decentralized technology reconstructs spatial collaboration paradigm

The traditional aerospace industry is highly concentrated in a few national teams and large enterprises, with high technological barriers, closed data, and closed resources. The introduction of blockchain and decentralized technology has the opportunity to break this closed pattern:

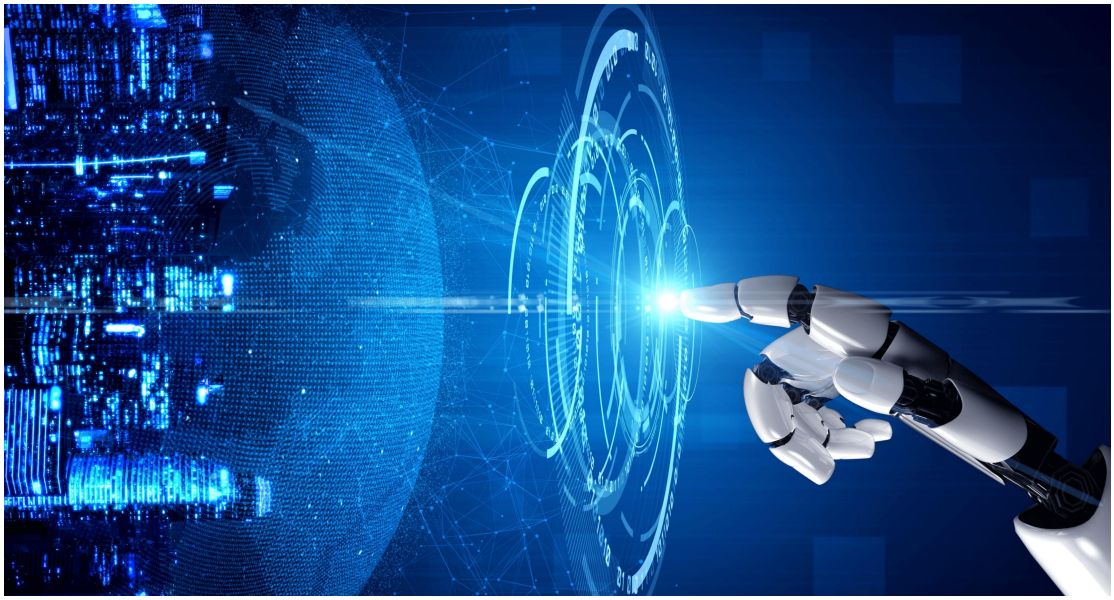
Satellite data can be traded and shared through decentralized networks, enabling more small and medium-sized enterprises to access remote sensing data services;

Global dispersed AI computing power nodes can be uniformly scheduled to provide distributed computing power support for aerospace data analysis tasks;

The calling, settlement, and evaluation of robot services can be completed through smart contracts, building an open market for robot services;

Data contribution, computing power contribution, and model contribution can all be quantified on the blockchain, forming a transparent and fair incentive mechanism.

StellarAI emerged in this era, dedicated to building a decentralized ecosystem base that integrates AI, Robotics, and SpaceTech.



3. Industry pain points and existing challenges

3.1 The utilization rate of aerospace data is extremely low, and its value has not been fully explored

Global satellites in orbit generate PB level remote sensing data every day, but the proportion of data that is actually analyzed and converted into commercial value is extremely low. A large amount of raw data is lying on the ground station's hard drive without undergoing intelligent processing.

The core reason is that:

Professional remote sensing interpretation talents are scarce, and the cost of manual analysis is high;

Inconsistent data formats make it difficult for small and medium-sized developers to directly use them;

Lack of AI automated analysis tools and high threshold for data processing;

The data trading market is not perfect, making it difficult for both supply and demand sides to match efficiently.

3.2 Mismatch of computing power supply and demand, and ineffective integration of distributed computing power

AI model training and inference require a large amount of computing power, but currently computing resources are highly concentrated in the hands of a few tech giants. At the same time, there are a large number of idle GPU computing nodes and edge computing devices around the world, which are not effectively organized to serve vertical scenarios such as aerospace data analysis.

The aerospace AI mission has unique requirements: it requires both high computing power to train high-precision remote sensing models and low latency edge inference to support real-time decision-making in orbit. The traditional centralized computing power cloud cannot flexibly meet the distributed and multi-level computing power requirements.

3.3 Fragmentation of robot services and lack of unified collaboration standards

The current robot systems are fighting on their own: industrial robot manufacturers, service robot companies, and drone operators each build closed ecosystems, and robots cannot collaborate with each other, resulting in inconsistent service call interfaces. Especially for special robots targeting aerospace scenarios, they are in a highly customized and isolated development state.

The lack of unified service registration, task scheduling, and value settlement protocols has resulted in the inability of robot resources to form a scalable network effect.

3.4 The aerospace industry is closed, making it difficult for external innovation forces to enter

The traditional aerospace industry has a long chain, high qualification requirements, and closed data, making it difficult for external AI companies, robotics teams, and developers to participate in aerospace innovation. The speed of technological iteration is slow, and a large number of private

innovation forces cannot be integrated and utilized.

The value of decentralization lies in lowering the threshold for participation, allowing global developers to contribute algorithms, computing power, and data to the smart space ecosystem, and share the benefits of ecological growth.



4. Project positioning and core value proposition

4.1 Project positioning

StellarAI is a decentralized infrastructure protocol designed for the integration of AI, robotics, and aerospace technology. We are not a single AI company or aerospace manufacturing enterprise, but a distributed collaborative network that connects technology suppliers and demanders.

The agreement is built around three core competencies

Intelligent computing scheduling layer: distributed AI computing power network, supporting satellite data analysis, robot model training and inference;

Robot service market: standardized robot service registration, task allocation, and settlement system;

Space data trading network: the entire process of collecting, cleaning, annotating, analyzing, and trading satellite remote sensing data.

As an ecological native token, STAI runs through the entire process of computing power trading, data trading, robot service invocation, governance voting, and ecological incentives.

4.2 Three core value propositions

Open Collaboration: Breaking down the closed barriers in the aerospace and AI industries, allowing global developers, computing power providers, data holders, and robot operators to participate equally in ecological construction;

Value quantification: Quantify all contributions of computing power, data, models, and robot services on the blockchain, and achieve fair distribution through token incentives;

Technological Inclusion: Lowering the development threshold for AI aerospace applications, allowing small and medium-sized enterprises, researchers, and enthusiasts to use ecological computing power and data resources to develop intelligent space applications.

5. Core business modules and technical architecture

5.1 Distributed AI Computing Network Module

This module integrates globally distributed GPU computing power nodes to provide elastic computing power support for aerospace data analysis tasks.

Business process:

Computing power provider: Connect idle GPU servers to the network, pledge STAI as computing power nodes, receive AI training/inference tasks, and obtain computing power revenue;

Task initiator: Remote sensing data team, AI developers submit model training tasks, satellite image inference tasks, and use STAI to pay for computing power fees;

Smart contract automatic matching: match the optimal computing power node based on task type, computing power requirements, geographic location, and latency requirements;

After completing the task, verify the validity of the calculation results on the chain and automatically settle rewards to the computing power provider.

Typical application scenarios:

Training of star remote sensing image object detection model;

Fine tuning of large models for natural language driven space mission Q&A;

Real time inference at the edge of orbit, supporting satellite autonomous decision-making.

5.2 Satellite Data Analysis Service Module

This module constructs a full chain AI processing pipeline from raw satellite data to commercial insights.

Core competencies:

Data access: docking with commercial remote sensing satellite ground stations to receive multispectral, high-resolution, and radar satellite raw data;

AI preprocessing: automatically completes radiometric

correction, geometric correction, cloud detection, and image stitching;

Intelligent interpretation: Built in multiple AI models, supporting analysis tasks such as surface classification, change detection, target recognition, disaster assessment, crop yield estimation, etc;

Data productization: Encapsulate analysis results into standardized data APIs and provide services to customers in industries such as agriculture, insurance, environmental protection, logistics, and government;

Data trading market: Data holders can upload raw data or annotated data, and data demanders use STAI to purchase, with profits automatically distributed to data contributors.

5.3 Autonomous Robot Service Network Module

This module is aimed at the application scenarios of ground special robots and space robots, and builds a decentralized scheduling market for robot services.

Types of covered robots:

Ground inspection robots (for electricity, pipelines, and industrial parks);

Unmanned aerial vehicle inspection and surveying;

Extreme environment operation robots (firefighting, chemical, nuclear facilities);

Future expansion: In orbit maintenance robots and space service equipment.

Business logic:

The robot operator will register the equipment on the blockchain, marking the service type, scope of operation, and technical parameters;

The demand side releases tasks (such as "conducting weekly security inspections on a certain park"), and the smart contract matches the optimal robot service provider;

During the execution of tasks by robots, real-time data is uploaded to the blockchain for authentication;

After the task is completed and accepted, the service fee will

be automatically settled to the robot operator;

As the "brain" of robots, AI models are provided by ecological developers, and calling the model also consumes STAI.

5.4 Intelligent Space Mission Scheduling Module

This module is aimed at satellite operators and space mission agencies, providing AI driven mission planning and optimization services.

Core Features:

Automatic scheduling of multi satellite collaborative observation tasks;

Intelligent scheduling of ground station receiving windows;

Optimization allocation of satellite energy and attitude resources;

AI assisted diagnosis and decision-making recommendations for abnormal situations.

This module is open to B-end space agencies and uses STAI to pay for service fees, with revenue flowing back into the ecosystem.

5.5 Technical architecture layering

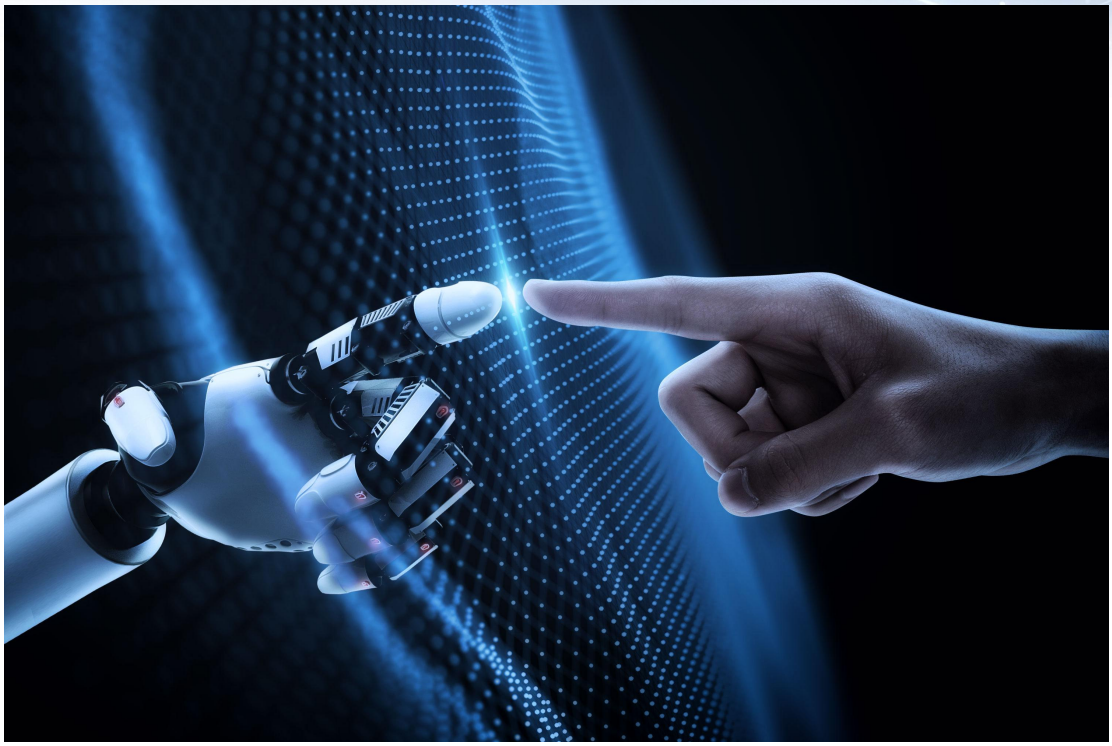
The entire protocol is divided into four layers:

Infrastructure layer: distributed computing power nodes, robot equipment, ground station data access;

Data and Model Layer: Remote Sensing Database, AI Model Warehouse, Annotated Dataset;

Smart contract layer: computing power scheduling contract, data trading contract, robot service contract, governance contract, allocation contract;

Application layer: APIs for developers, SaaS tools for enterprises, and community engagement portals.



6. Core competitive advantages of the project

6.1 Advantages of Technological Integration: Crossing Three Races to Build a Scarce Ecological niche

In the previous market, there were many AI projects, aerospace projects, and robotics projects, but projects that spanned the three hot tracks of AI+Robotics+SpaceTech and integrated resources through centralized protocols were extremely scarce.

The fusion advantages of StellarAI are reflected in:

AI is the 'brain' that provides intelligent decision-making capabilities for aerospace and robotics;

Robots are "hands and feet", the physical execution carriers of AI algorithms;

Aerospace is a 'scenario' that provides the most imaginative extreme application space for AI and robots

The ecological niche formed by the intersection of the three has both technological depth and narrative breadth, while attracting various community groups such as AI enthusiasts, robotics circles, space enthusiasts, and Web3 natives.

6.2 Data Loop Advantage: A complete flywheel from data to computing power to service

StellarAI is not a single track project, but has built a complete value loop:

Satellite generates data → data requires AI analysis → AI analysis requires computing power → computing power is

provided by distributed nodes → analysis results are encapsulated into services → service revenue feeds back data and computing power contributors → more data and computing power flood into the ecosystem.

Once this flywheel rotates, the data, algorithms, computing power, and services within the ecosystem form a positive cycle, and the network effect continues to strengthen, making it difficult for newcomers to break through competition on a single point.

6.3 Decentralized advantages: Distributed computing power and data break industry monopolies

Traditional aerospace AI services are highly concentrated in the hands of a few large enterprises, with closed data, expensive computing power, and opaque services.

StellarAI's decentralized architecture brings three major differences:

Cost advantage of computing power: Distributed integration of global idle GPUs can significantly reduce computing power

costs compared to centralized cloud vendors;

Data openness: Data contributors can directly receive benefits, incentivize more data sharing, and break down data silos;

Fair access: Any developer can submit AI models, access computing power nodes, and provide robot services without the need for centralized platform approval.

6.4 Token incentive advantages: multiple contribution dimensions, strong community consensus

There are rich dimensions of incentives within the ecosystem, and different types of participants can find their own ways of contributing:

Computing power provider: Contributing GPU computing power to obtain STAI;

Data contributors: Upload satellite data, annotate data to obtain STAI;

Model developer: Submit AI models, be called to obtain STAI;

Robot operator: Provide robot services to obtain STAI;

Community Governance: Participate in proposal voting to receive governance rewards.

The multiple contribution dimensions mean that the community consensus foundation is broad, not simply speculative, but supported by real ecological activities.

6.5 Narrative and Communication Advantages: Triple Story Overlay of Space, AI, and Robots

In the field of Web3 and technology investment, narrative driving force is extremely strong. StellarAI combines several of the most influential narratives of today:

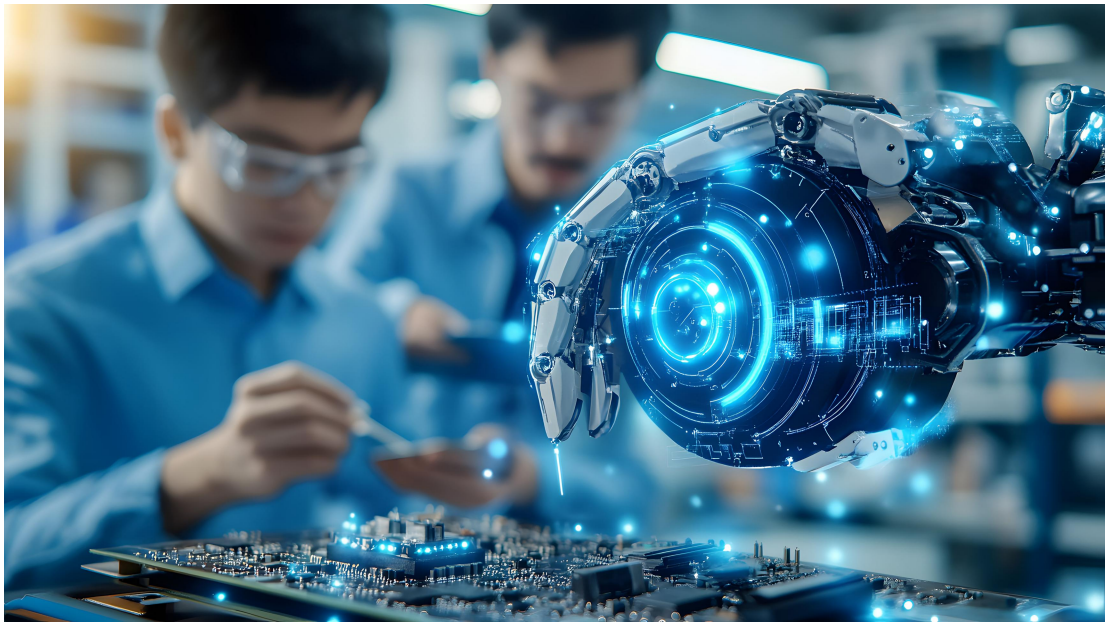
Space exploration narrative: Mars, satellites, in orbit services, with romance and imagination;

AI big model narrative: Artificial intelligence is currently the hottest technology track in the world;

Robot narrative: Humanoid robots and autonomous devices are the next industry trend;

Decentralized narrative: Web3 users have a natural sense of identification with open protocols.

The four fold narrative overlay gives the project natural advantages in social media communication, community growth, and brand building, which can quickly attract global attention.



7. Token Economy Model

7.1 Basic Token Information

Token Name: StellarAI

Token abbreviation: STAI

Total supply: 1000000000 STAI (one billion pieces)

Casting rules: constant total quantity, no additional issuance, with a hard upper limit built into the contract

7.2 Token Core Utility

Computing power payment medium: using STAI to pay for AI computing power fees in distributed networks, calling model training and inference services;

Data trading currency: When purchasing satellite data, annotating datasets, and analyzing reports, use STAI settlement;

Robot service invocation: scheduling robot services, paying inspection fees, priced at STAI;

Ecological governance rights: STAI holders can vote to

determine core rules such as computing power pricing, data access, robot service provider qualifications, and ecological fund allocation;

Contribution incentive rewards: reward tokens for computing power contribution, data contribution, model contribution, and community contribution;

Ecological pledge deposit: Computing nodes, robot service providers, and data shelving parties need to pledge STAI as a service deposit, which will be confiscated in case of breach.

8. Ecological participation roles

1. Computing power provider: Connect to GPU servers to provide computing power for AI training and inference, earning STAI;

2. Data contributors: Upload satellite data, annotate datasets, and participate in data ecosystem construction;

3. Model developer: Develop AI models for remote sensing

analysis and robot control, and launch them on the model market to obtain revenue from calling;

4. Robot operators: operate ground inspection robots, drones and other equipment, undertake tasks and earn service income;

5. Data consumers: customers in industries such as agriculture, insurance, and environmental protection who purchase satellite data analysis services;

6. Governance participants: STAI stakers, jointly deciding the direction of ecological development;

7. Development team: responsible for protocol iteration, technical maintenance, and ecological expansion.

9. Development roadmap planning

Phase 1 (Basic Construction Period): Complete core contract development and security audit; Launch MVP version of distributed computing power network; Connect to the first batch of satellite remote sensing data sources; Initiate early community contribution incentives;

Phase 2 (Data Service Period): Launch a satellite data analysis platform and introduce 3-5 standardized AI interpretation models; Open data trading market; Introduce the first batch of pilot robot service providers;

Phase 3 (Ecological Expansion Period): Scale up of Robot Service Network; Launch on chain governance function; Expand industry B-end customers; Initiate cross chain deployment;

Phase 4 (Space Evolution Phase): Explore the access of in orbit computing power nodes; Layout space robot collaboration scenarios; Build a global intelligent spatial data and computing power network.

10. Risk Warning

Technical risks: There is a possibility that the accuracy of AI models, the reliability of robots, and the processing of satellite data may not meet expectations due to technical iterations;

Compliance risk: There are regulatory restrictions on aerospace data and remote sensing observations in different countries and regions, and business operations require continuous compliance;

Market risk: The secondary market price of STAI token is affected by the overall sentiment of the cryptocurrency market and may fluctuate;

Ecological risk: In the early stages of ecology, the number of computing power, data, and robot service providers is limited, and the formation of network effects takes time;

Smart contract risk: The contract has been audited, but potential vulnerability risks cannot be completely ruled out.

11. Conclusion

Humanity is entering an era of deep integration of intelligence and space. AI gives machines the ability to think, robots give intelligence the ability to act, and aerospace technology gives civilization a broader stage. The intersection of the three is the outbreak point of the next round of technological revolution.

StellarAI does not pursue short-term narrative heat, but is committed to building a truly usable intelligent space infrastructure: allowing computing power to flow freely, returning data value to contributors, enabling robot services to collaborate openly, and allowing AI to truly serve space exploration and Earth perception.

We invite global developers, computing power nodes, data holders, robot operators, and space enthusiasts to participate in the StellarAI ecosystem and jointly build the next generation of decentralized space intelligent networks at the intersection of intelligence and stars.