

Orbitrum

Whitepaper

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Abstract

Cryptocurrencies and blockchain are among the major emerging technologies of the last decade and are likely to continue evolving in the years to come. The space is filled with new innovations and may have a significant impact on our daily lives. It is an exciting fast moving space. New projects emerge every day, new technologies are invented, and more and more data is created, making it difficult to keep up with all the changes, data and innovations.

While this presents one of the biggest opportunities of our time to get involved in this exciting space, there are also lots of risks involved. This space is full of fraud, false claims, hype, greed, emotional actors and projects fail.

This creates a situation where it is easy to be on the forefront of this new technology and make extreme wealth, but at the same time, one can lose it all.

The good news is that it is an emerging space that is just about to take off, and the timing to begin in 2024/2025 is perfect as it marks the very likely beginning of a new bullish cycle for cryptocurrencies and blockchain technology.

This whitepaper presents the Orbitrum project, which is created to deal with some of the major challenges in this space for beginners and experienced investors alike.

Orbitrum helps its users manage and track their portfolios, make smarter decisions, find new opportunities, learn about new technologies, share knowledge, automate and optimize their trading and strategy execution, and manage their risk.

Orbitrum is planned as the overall solution to navigate these markets successfully based on the 14+ years of experience of its developers and researchers in this space.

We focus on early-stage project research and tokens on decentralized exchanges to identify projects with significant potential upside.

Problem Statement

Over the past few years, we have witnessed multiple so-called 'market cycles,' typically occurring around the Bitcoin Halving, and we are currently at the beginning of a new cycle. Each of these previous cycles has resulted in substantial growth in the overall market, the number of projects, the data, the various technologies, and the complexity of the blockchain space.

In the early days, you could only buy a handful of tokens and do nothing but buy and hold. However, since the inception of the Ethereum platform with its smart contracts and the ERC20 token standard, this landscape has completely changed. Anyone can now launch their own token within minutes without any prior technical knowledge, and most other popular chains or Layer 2 solutions have adopted this token standard.

Nowadays, we are experiencing massive data growth, and new projects and tokens (cryptocurrencies) are launching literally every day.

During our initial research phase, we monitored new token launches on three different chains and their major decentralized exchanges (DEXes): Ethereum Mainnet, Binance Smart Chain, and Arbitrum from February 1, 2023, to May 1, 2023. On average, close to 100 tokens were launched every day! And that was during the "bear market".

The significant issue, besides the huge amount of data, was that more than 95% of them were scams. Tokens with removed liquidity, tokens with manipulated smart contracts you could not sell, tokens following a pump and dump scheme, and the like. Some were very obvious, but some had seemingly legitimate websites, followers, and documentation, making them hard to spot, especially for beginners.

In addition to pure scam projects, there are also many false claims in this space that may sound convincing to beginners but are obvious red flags to our experts.

"We are using blockchain to process data more efficiently"

Statements like this are all around. Did you know that every modern smartphone with a simple local database can handle far more transactions per second than even the fastest blockchains available? This statement is just pure marketing, to phrase it nicely.

"AI"

99% of the projects out there referring to AI use it for pure marketing or fraud.

First: If they ever create a product, they are most likely using some form of machine learning/large language models, probably based on the open-source available technologies or the ChatGPT API. Nothing new here, nothing special. So does Orbitrum as well, and there's nothing wrong with it.

But: Do you really think it is reasonable that any random crypto project solves some of the hardest AI challenges like distributed learning / training / models, privacy / security concerns, formal verification, realtime learning? Do you really think any of these random projects started a few weeks or months ago can beat all these billion-dollar tech companies that have all the greatest talents in this space in the world? Or even afford to train anything similar to ChatGPT, which costs close to a million USD per day to operate?

Very unlikely.

But as a non-technical person, it is very hard to detect all these false claims because most people just do not have the required domain-specific knowledge in this space. And these are only two very popular examples.

Other projects claim they have solved homomorphic encryption, which you probably have never heard of, but it basically means working with encrypted data without encrypting it.

Again, how likely is it that some random anon 3-week project solves this holy grail of encryption?

Projects are naming themselves "Bitcoin L2 Smart Contracts bla". Did you know that they usually just operate a simple multi-sig wallet, some forked standard software, and a bridge? If they decide to shut down, your money is gone. Completely centralized. They are abusing the reputation of Bitcoin to make some cash.

Do you know how NFTs are working? That they store their data in most cases on a simple server, rented for less than \$50 per month, operated by some random people you do not know. If the server is down, your assets are gone. Do you really want to put your life savings into one of those?

There are hundreds of examples like this, but I think you got the idea.

This space is full of false claims which are hard to detect or verify for non-experts. This makes doing proper research hard and very time consuming.

So why should you even bother, you may ask.

The interesting challenge is that some of these projects still present great opportunities on which you can still make huge amounts of money.

Investing in this space is a lot about hype and narrative. Memecoins with obviously no utility at all like Pepe went up to multiple billions. They are more like a bet on the virality of something, and they are very easy to understand for everyone, which makes them so interesting.

So if you don't want to leave money on the table, you might still buy some of these pure marketing projects or meme coins, exit soon enough, take your profits and never look back. This is more like playing poker, detecting bluffs, gathering as much information as possible, doing your math, controlling your emotions and being smarter.

This is where orbitrum comes into play as we help to become smarter and make the right calls at the right time.

Let me give you another example where many people fail.

Let's say we have two different tokens, Token A and Token B. Token A costs \$0.01 right now, and Token B \$10,000. As an investor, the question you have to ask yourself is: which one is more likely to make the next 10x move. Do you know?

Actually, you cannot, based on the given data alone. You need to account for the so-called FDV (Fully Diluted Valuation) of the project, the amount of tokens available, and many other variables to make this decision. If there are 100 trillion Token A and just 100 Token B, then Token A is even more expensive than Token B! This is hard to grasp for beginners, as the price of a token alone actually means nothing. The amount of tokens, the circulating supply, the fully diluted valuation, and all of these numbers matter.

And there are many more metrics like TVL (Total Value Locked), DAU (Daily Active Users), TPS (Transactions Per Second), Growth Rate, etc., which can be easily measured and monitored automatically but are hard to analyze manually.

And again, we addressed this issue by breaking down all the information for you in auto-generated reports and a simple scoring system.

Another big problem is the execution.

Finding great opportunities alone is not enough. You certainly want to benefit and participate in them, which usually involves buying the project token and joining their community. Data is only meaningful if you can act on it.

Some people keep Excel spreadsheets with hundreds of projects and wallets and get lost. Some people buy the wrong token and get scammed because usually whenever there is a new successful project launching, there are dozens of fake tokens with different addresses, trying to get your money.

Sometimes you need multiple wallets and accounts on different chains, need to bridge tokens, and keep track of all these actions. This becomes very hard to oversee very fast.

Buying and selling at the right time is also a big challenge. Keeping your emotions in control when you do your next 100x, taking profits, keeping your money, managing risk.

Keeping track of your investments is another significant challenge, especially if you have many different tokens on various chains. Although I have to admit that I made some huge profits on forgotten coins, most of them went to zero.

All this makes execution difficult, but even if you get that right, more challenges await you.

For example, you might not get the best price if you simply go to Uniswap or any other decentralized exchange and buy a token.

During our initial planning stage, we conducted some research here and found that most users are victims of something called Miner Extractable Value (MeV). Briefly explained, this means whenever you execute any transaction on most blockchains, they are stored in a temporary database (Mempool) before being picked up based on the amount of gas fee you paid.

Let's assume I see that someone wants to buy 1,000,000 ORB tokens. It sounds like a smart choice, of course, but be careful.

When you buy a token, you send this transaction to the Mempool, and there are people scanning this Mempool for all incoming transactions. If they see something like your swap, they could put a transaction with a higher fee in the Mempool, which is executed before yours, and then they sell the token to you at a higher price.

This explanation is simplified, and there are many more advanced attacks like this happening every day currently. In short, this is an issue where normal users are losing millions, and we are working on solutions.

To summarize the problems we are trying to solve:

- **Blockchain analytics:** Keep track of what is happening on the chain.
- **Wallet management:** Manage multiple wallets on various chains.
- **Portfolio tracking:** Understand what you bought, why, its current value, and when to sell.
- **Project research:** Stay informed about new projects, potential strategies to benefit from them, and share knowledge with others.
- **Risk management:** Minimize the risks associated with investing in early-stage projects.
- **Execution:** Facilitate easier, safer, and faster investing in new projects.
- **Task automation:** Automate the execution of DeFi strategies and trading.

There are many more issues, but I think you get the idea. This space is crazy and overwhelming. You need to be careful, but it is also one of the greatest opportunities of our time.

And that is why we created Orbitrum, as a solution to some of these challenges.

Solution

This section will explain how we are addressing the aforementioned problems. We cannot disclose all the solutions yet, but you should be able to get the ideas.

Our solution is called Orbitrum.

The Orbitrum components

The Orbitrum system is based on multiple components working together. The most important ones are:

- **Backend:** The backend works behind the scenes to gather and process all available information from the users and the blockchains. This is the heart of the project. The backend uses a distributed set of agents to handle all the data and utilizes external APIs when required.
- **Agents:** Agents are distributed workers primarily executing blockchain analytics tasks to gather information and process them into meaningful events. The agents are also responsible for task automation and trade execution.
- **Frontend:** The frontend is the user-facing component implemented as a browser application right now, which makes some of the backend functions available to all users.
- **API Server:** Most of the functionalities will be available as API for other projects or interested individuals to use.

This section is divided into the problems from the previous section and these components. Even though all of these components and solutions work together to provide the most benefit for our users. For more technical details, see the next section.

Backend solutions

The backend, even though being the heart of the whole system is usually invisible to the user. It is there working for you, but the only way to interact with it is through the frontend and the API.

Blockchain analytics

The backend, even though it is the heart of the whole system, is usually invisible to the user. It works behind the scenes, but the only way to interact with it is through the frontend and the API.

The blockchain is in general a more or less decentralized database, where all nodes agree on the "correct" state of the database. This state is then used to transfer values or execute smart contracts.

Most blockchains work by having the users send all their transactions to some of their blockchain nodes. All the transactions are bundled in a block, secured against manipulation by some cryptography and executed. Then this block gets attached to the blockchain and the new state synchronized across the network between all the nodes. So whenever you make a transaction on the blockchain, this state changes.

Every state change on the blockchain is an Event in Orbitrum on which you can run automated Actions like Telegram notifications or on chain token swaps.

The good news: These blocks and transactions are visible for anyone.

The caveat: You need to be able handle this huge amount of data.

Depending on the blockchain there might be hundreds of transactions included in a single block and dozens of blocks each second.

To gather insightful information you need to look into each block and each transaction for hundreds of different blockchains.

We solved this problem by having a lot of distributed agents and blockchain nodes.

The agent is a piece of software which knows how to parse all the blocks and transactions and aggregates this data into meaningful events on which you can automatically execute your strategies.

Example: Lets say, someone swaps 1 Ether for 1.000 \$ORB token on Uniswap v3 Arbitrum.

To do so, he has to call various state changing smart contract functions like approve or swap with different parameters like the amount he wants to approve or swap. Each of these calls alters the blockchain state, when it gets included in a block. Each of these calls also can emit events which are stored in the transaction logs. You can find this logs in the Events tab for the Uniswap Pair contract like here for the \$ORB token (

<https://arbiscan.io/address/0xa1817696a22253dab86023d252209d6ec02d2822#events>)

Smart contracts can't access this data, but external tools can.

So Orbitrum parses all new blocks on the monitored blockchains for this event logs, parses them and that way knows, what's happening.

Orbitrum knows about all transactions, swaps, all newly created pairs, all new tokens, every new smart contract, etc. in near real time.

You as an Orbitrum user can see all these events presented in a meaningful way and later automatically react to it.

Some of the Events are for example:

- **Token Creation events:** Whenever there is a new Token, Orbitrum knows knows about it
- **PairCreation events:** Whenever a new trading pair like \$ORB/wETH is available on a decentralized exchange, you can immediately trade it.
- **Mint events:** This event is emitted when liquidity is added to a liquidity pool (Pair contract). Sometimes this happens after the PairCreation event, and sometimes it might be a valuable trading signal depending on the situation.
- **Burn events:** When liquidity is removed again from a trading pair, the Burn event is emitted. This is actually an interesting one, because rugpulls, where 100% of the liquidity is removed, may happen like this. We can use this data to maybe protect you from that, details will be added in that section.
- **Swap events:** DEX swaps influence the available liquidity reserves for a trading pair and so the price you get for your token. By monitoring the swap events, we can reliably execute pending orders like stop losses or take profits just milliseconds after the event happened.
- **Transfer events:** A transfer event happens when you send ERC20 tokens from one wallet to another. There are millions of them, so we filter them and

only monitor the relevant ones. For example a big transfer wallet from an early investor in a project, might be a valuable trading signal.

- **Liquidity Events:** We are running various automated strategies to provide concentrated liquidity on Uniswap v3 AMMs. We have events in place to notify users when their position is out of range or back within range.

We monitor a few more events, but those are only for internal tests of new features for now.

To provide some context, on a relatively busy blockchain like BSC with a block time of ~3 seconds, there were approximately 15.9 million transactions per day at the end of 2021. During the following months of 2022/2023, this number ranged between 3 and 4 million transactions per day.

To handle all this data, we use powerful servers and a distributed software architecture, which is explained in more detail later.

In addition to real-time events, we also monitor other available on-chain data such as:

- **Smart contract constants:** When creating a new token, you upload the smart contract to the blockchain and set some values during the contract initialization, such as the name, the symbol, the decimals, or the total supply. These are just examples, and OrbAnalytics monitors many more things down to the bytecode level. We will delve into more detail on that after completing our research.
- **Token distribution and holders:** This information is valuable for making better investment decisions.
- **Smart contract functions:** Are there any malicious functions? Anti-whale functions? Mint functions? Are transfers pausable?

Risk Management

Warren Buffet, a renowned investor, is often quoted for his two cardinal rules of investment:

1. **Rule No 1: never lose money.**
2. **Rule No 2: never forget rule No 1.**

Managing your risk is the best way to follow these rules.

But:

In the realm of cryptocurrency, adhering to these rules can be challenging. Lose your keys, and your money is gone. Click on a deceptive link, and your money is gone. Invest in the wrong token, and your money is gone.

If you're new to the world of cryptocurrency, it's crucial to familiarize yourself with the basics. Understand what a hardware wallet is and adopt safe practices such as avoiding clicking on random links and not responding to unsolicited messages on platforms like Discord or Telegram.

Orbitrum is here to assist you with advanced scam detection for any token and a comprehensive database where you can easily look up a risk score (OrbScore).

To achieve this, we employ basic strategies such as querying existing security solutions for available data. This is typically effective for larger, more established tokens.

For those who want to stay ahead of the curve, like with our coin sniper strategies, we rely on our proprietary detection methods.

Some of these include:

- **Customizable filters:** For each new token or trading pair, you can define a set of rules. If a new token doesn't match your risk profile, you'll receive a warning. For instance, a token must be at least three months old, have a market cap of \$10 million, and liquidity of \$100,000.
- **Transaction simulation:** Most blockchain clients like geth support different methods of simulating a transaction. You can "fork" your own local chain and test the result of a transaction there, or you can use `debug_tracecall` rpc to verify the outcome of a transaction. We test a buy/approve/sell transaction to ensure that you can sell the token and it is not a honeypot.
- **Static Code analysis:** We analyze the compiled bytecode, even of unverified contracts, to detect suspicious behavior.
- **Dynamic Code analysis:** We run the contracts with different input parameters on a test environment to see the actual executed code paths and results of transactions.
- **Code Whitelist:** We are building a database of well-known default functions from established companies like OpenZeppelin, which are "good" to use and can therefore determine if anything is modified.

Please note, scammers are becoming increasingly sophisticated. While Orbitrum will assist you in detecting them, it cannot guarantee the legitimacy of a project. Always exercise caution and conduct your own due diligence.

Besides these technical low-level risk management tools, we also manage risks on a higher level.

Some examples are:

- **OrbScore:** Explained in more detail in the next section.
- **Auto-generated token reports:** An automated token report will be generated based on various on-chain data and the smart contract code.
- **Manual review:** Our researchers and community review new projects manually.
- **Position sizing and portfolio management:** The OrbScore is also available to assess the overall risk of a portfolio. If you are involved in too many high-risk projects or have too much exposure to a single sector, we can detect it and make suggestions to reduce the risk through better diversification.
- **Smart filtering:** You can set your personal risk preferences in your profile, and all projects and strategies are filtered based on this.
- **Automated Orders:** Orbitrum allows you to set automated Stop-Loss and Take Profit orders. These are explained in more detail in the section below.

The OrbScore

The OrbScore is one of the major functions of our platform and one of our contributions to making the crypto space/DeFi safer for the general public. Risk management is a key factor in success in this space, and we all hate losing money to scammers.

The OrbScore is a risk measurement tool that includes different parameters like liquidity, market cap, on-chain metrics, and social metrics, and combines them into a single number ranging from 0 (very high risk) to 100 (low risk). This enables you to assess how risky a token or your overall portfolio is.

For all tokens in our database, we calculate the OrbScore, and if you have an OrbTrader bot running with us, you can always see the total OrbScore of all your tokens in the balance section. We will also soon allow you to check the OrbScore of any external wallet.

Whether you are a beginner or an experienced coin sniper, you should always check the OrbScore of a token before you buy it!

How to use the OrbScore?

The OrbScore of a token is displayed in every token report and when you are searching for a token to trade in our database.

In your account section, you can set your personal OrbScore. By default, this is set to 50, which is a reasonable default for beginners who just want some extra security. Setting your OrbScore there will only show you tokens on our platform with a score higher than 50. You will not be able to buy any token with a score below that.

If you want to use the sniper strategies, especially the pair snipers, you have to set your OrbScore to 0. This will disable this feature and only give you basic protection.

How is the OrbScore calculated?

Internally, the OrbScore consists of two numbers: the OrbScore (`o_score`) and a relevance score (`r_score`).

The OrbScore includes different on-chain and off-chain metrics and calculates a weighted sum, resulting in a number between 0 and 1. On-chain metrics include liquidity, total supply, number of holders, etc., while off-chain metrics include social followers, Twitter mentions, GitHub activity, etc.

The relevance score is a sum of the weighted available parameters. So when we have more information about a token, the relevance score increases. It always has a value between 0 (not relevant, because we have no information) and 1 (very relevant, all information available).

The final OrbScore is calculated as follows: $\text{orbscore} = \text{o_score} * \text{r_score} * 100$

For example, let's consider a token with a liquidity pool on a decentralized exchange (DEX) worth \$1,000,000 USD and a total market cap of \$10,000,000 USD. We assign weights to each of these parameters based on their importance to the overall risk of the token. Let's say the liquidity weight is 0.9 and the market cap weight is 0.5.

To scale our token values to a value between 0 and 1, we need a reference max value, which is dynamically adjusted based on market conditions. The reference value for liquidity is the total WETH liquidity available, while for market cap, it's the fully diluted market cap of WETH (assuming we have a single pool project).

In this simplified example, the relevance score would be calculated as follows:

$$r_score = (0.9 + 0.5) / 1.4 = 1$$

Both relevance weights are added because both pieces of information are available, and the sum is divided by the total sum of all metric weights.

So, our final OrbScore would be:

$$(1000000 / total_weth_liquidity * 0.9 + 10000000 / fully_diluted_marketcap_weth * 0.5) * 1$$

This example is simplified to avoid using complicated formulas, but the OrbScore works with many different parameters, not just two.

Our current research focus is to determine the weights, and we are using different AI models to find correlations between the input parameters (such as liquidity) and the risk/success of a project.

As our database of tokens grows, this process will improve over time, and we plan to publish the full source code and a detailed paper on this topic.

Execution

The Orbitrum backend enhances transaction execution through several methods. Rather than relying on publicly available Mempools, which are susceptible to frontrunning, we utilize private transactions and bundle them to minimize fees and mitigate various scenarios involving Miner Extractable Value (MeV).

Additionally, we provide various automated order types such as take profits or stop losses. Leveraging blockchain analytics data, we continuously track the precise token amounts available for any swap at any moment. With this information, we can automatically initiate or close positions according to your customized settings, freeing you from the need to monitor charts constantly.

Fully Automated strategies

Orbitrum provides a user-friendly system for creating fully automated strategies in a straightforward format. These strategies can be executed automatically and shared with other users.

Additionally, manual strategies are available, allowing users to configure step-by-step tasks to achieve specific goals. While useful, these manual strategies are less emphasized in this paper.

We offer the following categories of strategies and might add more in the future:

- **Coinsniper**
- **Delta Neutral Farming**
- **Leveraged Trading**
- **Airdrop Farming**
- **Liquidity Management**
- **Spot Trading**
- **Custom**

It is based on **EventHandlers** and **Actions**.

Whenever an OrbEvent happens, automatically execute an OrbAction.

Just ignore the "Orb" if it confuses you. So whenever an event happens, we execute an action.

To do so we need to define the events, the actions and a way to match both, which is the OrbStrategy.

Example 1: Coinsniper

A Coinsniper strategy tries to buy newly launched tokens as fast as possible and sell them automatically after reaching a certain take profit level. They can be implemented with an EventHandler and an Action.

WHEN LIQUIDITY_POOL_CREATED events happen and FILTER do ACTION_BUY_TOKEN.

So when a new token is launched, buy it.

The filters are the biggest challenge here to get right. That was basically how we came up with the Orbscoring system to reduce the risk. Like mentioned before many are scam tokens, so one of the filters is the transaction simulation, if we can buy and sell the tokens. Another filter is the available liquidity, as we are only interested in tokens with a minimum liquidity pool size of for example 10.000 USD.

Finding and training all the different parameters is one of the applications where we currently utilize machine learning algorithms.

To implement this strategy in Orbitrum, you need to follow these steps.

First, we define the event:

OrbEvent: A new trading pair is created on Uniswap V3 Ethereum Mainnet. This event includes various parameters such as the DEX (Uniswap V3), the blockchain (Ethereum Mainnet), and the event type (`new_pool_created`).

Next, we define the actions. Actions can be reused for multiple events.

OrbAction 1: Send a notification to me on Telegram. This action triggers a message on Telegram whenever the specified event occurs. Other channels like Discord or Twitter are also supported.

OrbAction 2: Purchase the new token for a fixed amount of 0.1 ETH and set stop-loss/take-profit orders. This action integrates with the OrbTrader execution engine, enabling various DeFi actions such as swapping to acquire the token. Additional actions for advanced DeFi strategies like concentrated liquidity provision and delta-neutral farming are also available.

Then, we define the matching rules to connect an event with an action.

OrbEventHandler: When a new trading pair is created on Uniswap V3 Ethereum Mainnet, perform OrbAction1 and OrbAction2.

The event handler consists of a filter to match OrbEvents based on parameters like the chain and the DEX, as well as a list of OrbActions to execute in a specified order when the event occurs.

Finally, we have the OrbStrategy, which is a group of OrbEventHandlers describing different events and actions to execute. The strategy also includes default values such as the buy amount and slippage.

Strategies encompass multiple event handlers, bots, and chains, allowing for various trading systems ranging from simple sniper strategies on a single DEX to complex multipool arbitrage strategies.

Example 2:

One of the strategies we are running fully automated is providing concentrated liquidity for Uniswap v3 for a special kind of token. For this special strategy we need to concentrate our liquidity in a very narrow price range to gain the biggest benefit.

To implement such a strategy in Orbitrum you would need to create a strategy configuration, which is just a json file containing the configuration parameters like the smart contract addresses.

Then you would create multiple EventHandlers.

Interesting events for this strategy are LIQUIDITY_ADDED, LIQUIDITY_REMOVED, LIQUIDITY_POSITION_OUT_OF_RANGE.

Now you could define your eventhandler as a simple rule.

WHEN the LIQUIDITY_POSITION_OUT_OF_RANGE events happen and FILTERS are true DO XXX.

Filters in this case would be your Liquidity Position NFT id. So you only want to monitor and execute this for your own positions obviously.

And XXX in this case is a combination of one or multiple automated actions. In this case it would make sense to execute the REMOVE_LIQUIDITY action in combination with a CREATE_LIQUIDITY_POSITION and maybe SEND_TELEGRAM_NOTIFICATION action.

The exact details of the configuration for all of these actions can be found in the strategy configuration. So you can configure the range for your liquidity or the details of your telegram notification bot. Also all of these parameters can be overwritten in the custom action configuration.

Technically this works by monitoring all the swaps (as mentioned in the blockchain analytics section), get the new tick position and compare it to the upper and lower bounds of the filtered position.

There are many interesting opportunities with automated strategies, but I hope you got the idea. So now we will focus on the frontend side a bit more and how average users can benefit from all of this.

Bots

Strategies like the examples above can be shared on the Orbitrum marketplace and each user can configure and execute this strategies for themselves.

This custom configuration of a strategy is stored in a so called Bot. To run a strategy you need to configure such a Bot and give it some details like on which blockchain to run, which positions to check or which wallets to use for this strategy.

The agents then automatically run these bots in a fixed time interval and execute the configured strategies.

Frontend Solutions

The frontend serves as the interface through which users interact with the Orbitrum Backend. It is a web application accessible via any modern browser. As the frontend undergoes continuous updates, the best way to experience it is by trying it out.

Notice: We are no frontend developers and our interest and focus is the backend. So consider this Frontend as a limited MVP showing a very limited subset of the available features.

The MVP is deployed on <https://app.orbitrum.net> and anyone can register for a free limited account to test it and provide feedback.

The frontend is structured into three main sections, each containing various subsections, which are briefly explained in the following section.

Core

In the core section you can get a broad overview of the system and your wallets, your portfolio, important events and the system activity.

- **Dashboard:** Give a brief overview of the overall system and progress.
- **Wallets:** Allows for managing multiple different wallets.
- **Portfolio:** Get an overview of your portfolio and investment performance.
- **Calendar:** See the latest events and track custom events like token unstakes or vesting schedules and new launches.
- **Activity:** See the system activity like new projects, strategies or reviews.

Research

In the Research section, you can access the latest projects, strategies, and helpful tools for your research, including our AI-based auto researcher. Project research is

divided into two parts: on-chain research, which is automatically handled by the backend, and off-chain research, which is conducted manually by users with assistance from automation tools like an AI Research Bot.

- **Projects:** The Project section enables you to conduct research on new projects, submit new projects to the system, or write reviews and engage in discussions with other users.
- **Market:** We provide a marketplace where users can share their strategies and subscribe to publicly available strategies. Charging for these services in the future is an option that is already prepared for.
- **Tools:** Various tools are available to expedite your research, including sentiment analysis, various market indicators, web scrapers, and others.

Execution

This section is all about executing various tasks like trading or strategies.

- **Strategies:** This section allows you to create and publish strategies. You can also get an overview of your currently subscribed strategies.
- **Bots:** Bots are the configuration for strategies and can be configured here.
- **Trading:** After your research is done, this section is where you can buy new tokens, place limit and market orders and manage your portfolio.
- **Adrop:** This is a temporary feature probably utilized for a special kind of strategies related to airdrop farming.
- **Daily task:** This feature is designed for anyone looking to enter the crypto space, learn about new projects, and potentially earn airdrop rewards. The daily task algorithm suggests strategies or projects based on your previous actions, guiding you on what to explore next.

Social functions

One of the fundamental principles of Orbitrum is to foster collaboration, learning, and community growth. Sharing knowledge and building a robust community are among our top priorities.

To facilitate this, we've integrated numerous social functions into the Orbitrum frontend. Users can comment, discuss, and review projects. They can also rate reviews and follow other users. Additionally, users can publish their trades and portfolios, enabling others to follow their activity.

All user-generated content provides an option to share it publicly or keep it private. While privacy is respected, we encourage users to default to the public sharing option so that all users can benefit from shared insights.

API

Most features such as the Orbscore, automated token reports, copy trading, or notifications are accessible through APIs for integration with external applications.

Furthermore, we provide an API integration into the system for transaction execution. This functionality proves useful, for instance, if you wish to connect an existing Tradingview strategy and utilize its webhooks to execute trades on decentralized exchanges via Orbitrum.

Technology Overview

The following section gives a brief overview of the used technologies.

Code

Our primary programming language is Python 3.11. Utilizing Python enables us to make rapid progress while maintaining a well-documented and easily readable codebase that is simple to maintain. We adhere to all relevant documentation, formatting, testing standards, and conventions.

We follow a Test-Driven Development (TDD) approach, meaning that all of our software undergoes fully automated testing. Our methodology involves writing tests before writing the main code, ensuring that the test passes successfully before moving forward. If any issues arise, we add new test cases and address the problems accordingly. This approach guarantees the highest quality of code and allows for efficient refactoring without the risk of introducing errors when implementing new features or enhancements.

Additionally, we employ other programming languages as needed, such as JavaScript for the frontend, Rust for performance-critical routines, and Solidity for on-chain smart contracts. However, our preference is to leverage Python wherever feasible. This approach streamlines the management of various components with minimal effort and enables a single developer to work across all components of the project seamlessly.

External Code

Whenever possible and permitted by the license, we leverage existing code and external libraries. Solutions to common problems, such as distributing tasks across multiple nodes, have already been addressed, and we aim to avoid reinventing the wheel.

However, we also strive to minimize external dependencies to only what is essential, ensuring that we work with thoroughly tested, high-quality software that is actively maintained or easy to continue developing. This approach helps maintain stability and reliability while maximizing efficiency in our development process.

Scalability and Performance

Our primary focus is to develop all the necessary features to ensure a seamless user experience and make Orbitrum as useful as possible.

However, the backend architecture has been designed with scalability in mind from the outset.

The architecture of Orbitrum is based on a distributed system with multiple agents monitoring various blockchains and executing bot actions. Broadly speaking, we employ a distributed message queue and a distributed task queue. This involves running numerous servers that scan all supported chains, gather data, and store it in a centralized database. Based on on-chain events, tasks are executed across multiple servers.

For instance, when a swap event occurs, it's added to our message queue, and one of our worker agents pulls the event, updates the locally monitored liquidity pools, and enables automatic execution of limit order transactions or stop losses. This automated transaction execution creates a new task in our task queue and is executed within milliseconds. This approach ensures fast and scalable handling of large volumes of real-time events.

We have conducted load tests, and currently, a single medium-sized server can handle over 100,000 events per second with a delay of less than 4 milliseconds. This allows us to analyze over 30 different blockchains in real-time. However, Orbitrum is designed for easy horizontal and vertical scaling, requiring minimal overhead. Additional servers can be added easily as needed.

Scaling Orbitrum is straightforward. Adding new blockchains involves configuring the node/RPC settings and adding them as database entries. Similarly, deploying additional agents and servers using pre-built Docker images is a quick process.

We employ priority task queues and distribution where necessary to optimize system performance. For example, to address network latency issues inherent in decentralized systems, we place agents on the same server as local blockchain nodes, minimizing latency. Additionally, we utilize IPC communication over Unix Sockets instead of HTTP RPC requests, and temporary blockchain state data is stored in a high-speed in-memory cache, improving runtime performance.

We continuously research and explore potential improvements to ensure that Orbitrum remains robust, scalable, and capable of handling future advancements in blockchain technology.

Security

Security has been a paramount concern for Orbitrum since its inception, with a focus on protecting private keys and personal data, which could potentially compromise user identification.

During the launch of our first fully automated coinsniper strategies in July 2023, we implemented a system where users could deposit funds into a hosted hot wallet managed automatically by us. Private keys were encrypted with a user's public key within their browser and stored on a separate signing system with stringent security controls. Our frontend servers, which are complex systems, never had access to these keys, and the signing system was not publicly accessible.

However, we realized that this approach posed risks, as adhering to the principle "not your keys, not your coins" is paramount.

The most secure method to safeguard sensitive data like private keys and personal information is to avoid storing them altogether.

As a result, Orbitrum no longer stores any private keys and does not have access to users' wallets or funds.

Features like limit orders and transaction automation, which require private keys, now utilize pre-signed transactions. Users sign transactions within their wallets in the frontend, and Orbitrum facilitates the execution.

While this is a temporary solution, we are actively exploring a final non-custodial approach. Recent advancements in account abstraction and intent-based designs show promise in this regard.

Additionally, we are considering leveraging hosted key management services like Amazon's KMS to eliminate the need for storing and managing private keys.

Regarding personal data, Orbitrum does not require any from users.

While providing a valid email address during signup is optional for notification purposes and account recovery, users are free to use a proxy/VPN and enter an invalid email address for privacy reasons.

Orbitrum only operates with and stores publicly available data, ensuring user privacy and security.

Major Technologies used by Orbitrum

The following list names a few of the major technologies we are using. It is not exhaustive but should give you a good idea of our technology stack.

- Python programming language
- Operating System: Our development, testing and deployment happens on Linux and mostly Debian or Debian based distributions like Ubuntu.
- Programming Environment: Visual Studio Code, Python, Poetry, Virtualenvs
- Docker, Nginx, gUnicorn
- Celery for task distribution
- Web3.py library for the smart contract interaction (including all the amazing python libraries around the EVM ecosystem)
- PostgreSQL database
- Redis as fast in memory cache for storing all blockchain states
- Git for version control - we utilize encrypted private repositories
- Django / HTMX for the frontend - this allows us to stick with Python wherever possible and use Javascript only when absolutely necessary for the user experience
- Telegram for user notifications

Tokenomics and the \$ORB Token

The \$ORB Token was launched in Mai 2023 with the inception of the Orbitrum project on Arbitrum (Layer 2 of Ethereum) as a utility token for Orbitrum.

The \$ORB token is not an investment token!

It has two primary use cases for holders at the moment:

- To explore the Orbitrum ecosystem and gain **access** to advanced features within the system and early access to information
- As a **governance** mechanism where holders can decide about upcoming features and the future development of Orbitrum

Exploring automated trading possibilities, strategy vaults, and reward emissions in ORB tokens or internal rewards with \$ORB tokens is an intriguing prospect for Orbitrum. However, current limitations stem from unclear legal regulations and a lack of priority. Nevertheless, as regulations evolve and priorities shift, these possibilities may become more feasible in the future.

The ORB token holds significance within the Orbitrum ecosystem, serving as a valuable tool for testing and developing governance and access control mechanisms. Additionally, requiring \$ORB tokens helps deter spam and provides a means for internal user incentive mechanisms and payments within Orbitrum's marketplace and other features.

While the current utilities of \$ORB tokens are focused on testing and development, there is potential for additional utilities to be added in the future, enhancing its value within the Orbitrum ecosystem.

Access Control: The Orblevel

The Orblevel system within the Orbitrum platform assigns a level to each user based on the amount of \$ORB tokens held in their wallets. This Orblevel determines the user's access to certain features and resources within the platform.

To ensure a sustainable and community-focused approach, there are limited slots available for each Orblevel, with the possibility of increasing these limits over time and expanding access to features. This limitation helps manage maintenance costs and fosters a stronger sense of community engagement and feedback.

Users have the flexibility to upgrade their account at any time if slots are still available for their desired Orblevel. This process involves signing a valid transaction from a wallet containing the required amount of \$ORB tokens. The Orbitrum backend regularly monitors the token balance in the user's wallet and automatically adjusts their Orblevel if tokens are sold or transferred. This mechanism ensures that users maintain access to their desired level of features based on their token holdings.

Currently the following Orblevels are available:

- **ANON**
- **Beginner**
- **Advanced**
- **Degen**
- **OG**

In the Orbitrum platform, there are several Orblevels available to users, each offering different levels of access and privileges. Two special Orblevels are the ANON and OG levels:

ANON Orblevel:

- This Orblevel is accessible to all users without requiring any \$ORB tokens.
- Users with an ANON Orblevel can participate in a limited subset of features, such as project research.
- Some features, including transaction automation, content submission, tool access, and wallet monitoring, may be disabled for ANON accounts.
- Despite limitations, ANON accounts still provide valuable functionality for users.

OG Orblevel:

- The OG Orblevel is reserved for highly active community members who contribute significantly to the Orbitrum project and community over an extended period.
- Unlike other Orblevels, the OG Orblevel cannot be purchased; it is awarded to individuals based on their contributions.
- Users with OG Orblevels have access to exclusive content, including private code and DeFi research developed by the Orbitrum team.
- This Orblevel serves as a recognition of valuable contributions and offers additional benefits to dedicated community members.

Users can view the currently available Orblevels, their associated limits, and privileges within the Orbitrum app and documentation. These Orblevels are designed to cater to different user needs and levels of engagement within the Orbitrum community.

Tocenomics

Total Token Supply:

- There are 10,000,000,000 \$ORB tokens in total.

Token Allocation:

- 100% of the tokens were initially provided to the Uniswap V3 liquidity pool.
- The team acquired a portion of the early tokens to facilitate testing and development of Orbitrum components that rely on the tokens.

Token Trading:

- \$ORB tokens are freely tradable via the liquidity pool on Uniswap V3. The liquidity is locked.
- Users interested in trading \$ORB tokens can do so via automated trading mechanisms.

Future Distribution:

- As the Orbitrum platform evolves and matures, additional tokens from the team may be distributed to the Uniswap pool.
- This distribution strategy aims to facilitate new users' access to \$ORB tokens and enhance liquidity within the ecosystem.

Usage and Governance:

- The specific future usage of the team-acquired tokens is yet to be determined.

- Ultimately, the goal is to distribute tokens equitably among users and community members, fostering strong governance mechanisms within the Orbitrum ecosystem.

By providing transparency and accessibility to \$ORB tokens, Orbitrum aims to promote user engagement, liquidity, and community involvement within its platform.

Airdrop

There are 1 Billion \$ORB tokens reserved for a future airdrop to early active participants and users. Therefore the frontend tracks some user actions like submitted projects, logins, reviews, votes, comments or new user invites. Based on this activity these 1 Billion tokens will be distributed.

Technical Details

Platform: Arbitrum One

Contract Address: 0x54F983F1407D6ec30C6B7633F2Bf05a672a7f216 (always double check the contract addresses and that you are connected to Arbitrum!)

Total Supply: 10.000.000.000 token

The whole supply was provided to a Uniswap V3 liquidity pool on Arbitrum during launch. No more tokens can be minted. The liquidity is locked.

Trading Pair ORB/WETH: 0xa1817696a22253dab86023d252209d6ec02d2822

The token contract is verified and you can find the source code here:

<https://arbiscan.io/address/0x54f983f1407d6ec30c6b7633f2bf05a672a7f216#code>

It is an audited standard contract based on OpenZeppelin and the ERC20 standard. We have no anti whale functions, blacklists, whitelists, mint functions or other custom features which allow any kind of manipulation or changing it later. We also have no Buy or Sell taxes.

The contract ownership was renounced so nobody can modify the token in any way.

A liquidity pool for trading was created on Uniswap V3 Arbitrum during the fair launch and the liquidity is locked.

Use Cases

The system was designed with mostly our own requirements in mind as full time researchers and crypto investors. Additionally we value our user feedback a lot and implement requests features.

Some typical use cases we had in mind when building the system were:

- **Buy and Hold investors:** Orbitrum provides tools for comprehensive project research, risk assessment (OrbScore), and portfolio tracking. Users can monitor their wallets and portfolios efficiently, enabling them to make informed decisions about their investments.
- **Degen Traders:** For those seeking high-risk, high-reward opportunities, Orbitrum offers features to discover and participate in early-stage projects. Users can benefit from automated strategies and trading execution to capitalize on potential gains while managing risks.
- **DeFi Users:** Orbitrum caters to DeFi enthusiasts by offering tools to explore various yield-generating strategies such as staking, yield farming, liquidity provision, and more. The platform assists users in executing and monitoring these strategies, optimizing their returns in the decentralized finance space.
- **Airdrop farmers:** We are not talking about Sybil attacks here, but people who have a few wallets and some time to test new protocols and projects to earn possible rewards and provide valuable feedback. This is especially for beginners a very good strategy to get involved into the ecosystem, learn a lot by doing and earn rewards.

Through its versatile features and user-centric approach, Orbitrum strives to empower individuals with the tools and knowledge needed to thrive in the crypto space, regardless of their investment preferences or experience levels.

Roadmap

The project started in May 2023 and the first automated strategies were available in June 2023. From there we progressed a lot by scaling the backend, implementing many of the functionalities mentioned in this paper and offering a web based user interface.

The first public Alpha Version was released in October 2023 still with the primary focus on automated coinsniper and trading strategies.

In November 2023 we decided to expand our application to include more strategies and use cases. The first public alpha version went live in December 2023 and since then we are collecting user feedback and improving the system.

Right now the complete project is self funded and all the running costs like servers, nodes, 2.400+ hours research and development are paid privately as this is a passion project and we love what we do.

But that also means that scaling beyond our personal needs would increase the costs as more nodes, more chains, more external API requests, more Feedback to handle, more Support, etc. are required. This will only happen slowly, but we are here to stay.

Lucky for our users, our personal needs are quite exhaustive and we listen to and value our user feedback.

So whenever there are new feature requests, we try to implement them if they make sense and benefit the overall project and user experience. **This user feedback has the highest priority for us.**

Major upcoming features we would like to build are:

- **Improved automation**, especially secure fully automated strategies
- **Special trained LLMs** for assisting our research
- Research the possible applications of **Machine Learning for automated trading strategies**
- More **social functions** - imagine a social network for crypto investors
- Integrate **more blockchains** and protocols / events / actions
- Improved **automated security analysis** of projects and tokens

- There might be some **marketing** also in the future - but this has no priority - as our product success is not dependent on new users or investors

Disclaimer

Most of the aforementioned features are working and developed at least up to an MVP (Minimum viable product) stage to showcase our solution. But as the crypto space evolves rapidly, so does Orbitrum. So things might change fast especially during the early stages of development.

The same is valid for this whitepaper. Most people do not read whitepapers, but as I do, I liked the idea of having a whitepaper for Orbitrum. But it is just a snapshot of the current progress and ideas and might be outdated soon. Updating it has no priority, but we are always open for questions regarding our technology and development.

The Orbitrum platform is currently in its early alpha stage of development. As such, users should be aware that the software may contain bugs, errors, or other issues that could result in unexpected behavior or malfunctions. We make no representations or warranties of any kind, express or implied, regarding the reliability, accuracy, completeness, or suitability of the software for any particular purpose.

All users acknowledge and accept that their use of the Orbitrum platform is entirely at their own risk. We disclaim any and all liability for any damages or losses arising from the use of, or reliance on, the software, including but not limited to direct, indirect, incidental, consequential, or punitive damages.

Furthermore, it is important to note that the information provided within the Orbitrum platform, including but not limited to project data, analysis, and recommendations, is for informational purposes only. Nothing within the platform should be construed as financial, investment, or trading advice.

Users are solely responsible for conducting their own research and due diligence before making any investment decisions. We strongly encourage users to consult with a qualified financial advisor or professional before engaging in any financial activities.