



One Game

Decentralized Virtual World

V 1.02



One Game

Introduction: Pushing the Boundary between the Real and Virtual World

1. What is *One Game*?
2. The Players' and Gamers' Experience of *One Game*
 - A. User Account
 - B. Land System
 - C. Game Assets
 - D. Avatars
 - E. Scripts
 - F. Lobby
3. Technical Architecture Based on Deepbrain Chain
 - A. Selection of Game Engine
 - B. Developers' Tools
 - C. Smart Contracts on Deepbrain Chain
 - D. Services Hosted by a Miner

- F. Version Management and Security Mechanisms
- 4. Consensus in *One Game*
 - A. Popularity Rank
 - B. Competitiveness Rank
 - C. Version Upgrade Based on Proof of Popularity and Proof of Competitiveness
- 5. Self-evolvement of the Platform Based on Genetic Algorithm
- 6. A Tokenized Ecosystem on Top of Blockchain
 - A. Introducing *OGT (One Game Token)*
 - B. *OGT* Usage
 - C. Incentive Program
 - D. *OGT* Pricing Mechanism
- 7. *OGT* Allocation
- 8. Project Roadmap
- 9. Team

Introduction: Pushing the Boundary between the Real and Virtual World

Atari pioneered video gaming with the introduction of *Pong* in 1972, and technology and design concepts continued to advance in the ensuing half century. Hardware has consistently evolved into better consoles, while video games have been integrated into PCs, mobile devices, and virtual reality (VR) gear as developers build more innovative gaming experiences.

Video gaming has grown into a worldwide cultural phenomenon. Contemporary developer Tencent Games multiplayer online battle arena competition *Kings of Glory* demonstrates the ascendance of the medium: the mobile platform hosts over 80 million daily active players and 200 million monthly active players as a result of its unique design and seamless social network integration.

Video gaming popularity has also translated into big money. According to the Global Games Market Report by Newzoo, 2.2 billion gamers across the globe are expected to generate \$108.9 billion in game revenues in 2017.

Meanwhile, recent advances in 3D modeling and virtual reality technologies have inspired developers to blur the boundary between the real and virtual world. The *Grand Theft Auto (GTA)* series by Rockstar Games, for instance, allows the player to take on the role of a criminal in a big city. The scenes are so lifelike that every game in the series has been criticized for its graphic and uncanny portrayal of reality.

Despite these advances, modern games still suffer from significant limitations. Most games in today's market, are pre-designed by developers along with pre-programmed stages or rules. Flexibility within the game is limited. No matter how good the game is, sooner or later players lose interest.

Additionally, the rules and judgments in the existing games are not always transparent or fair, and often incite complaints among players.

Game players lack control, while the corporate game designers and developers hold the ultimate power within the gaming environment. Gamers are relegated to a subservient position, and game developers act as masters.

The advent of blockchain technology now allows us to overcome these limitations. We can create a decentralized virtual world in which the gamer and user is the ultimate owner, creator, and ruler.

One Game will build a decentralized and self-evolving world governed by creators, gamers, and players. This is a radical paradigm shift in which the players and gamers will now have ultimate developmental control of their virtual reality.

As Buddha says, "Every flower has its own world." *One Game* will allow the flower to blossom.

1. What is *One Game*?

One Game is a decentralized virtual world built on top of blockchain technology. *One Game* has no pre-defined gameplays or objectives, but is an open platform owned by users and players. The platform offers considerable flexibility along with user control and player governance.

Users can connect to the *One Game* platform through a PC, VR, or mobile device, supported by a basic infrastructure and engines driven by a cryptocurrency ecosystem.

One Game allows a user to develop customized characters, scenes, plots, gameplays, or algorithms – it offers limitless user creativity. A player can control his virtual avatar, freely visit any scenes, play different games, compete with other players, and make new friends.

We have invented two sets of consensus algorithms integrated into the *One Game* blockchain: Proof of Popularity and Proof of Competitiveness. Our goal is to create a decentralized value measure for developers and players, and give them scores and rank by their contribution in *One Game*. They will be rewarded with our tokens, *OGT*.

Finally, *One Game* upgrades the system and evolves through decentralized governance. The boundary between the real and the virtual world will eventually disappear as the platform grows, and player imagination prospers.

2. The Players' and Gamers' Experience of *One Game*

Players and gamers are the owners and developers of the platform and this virtual world, which consists of the following fundamental components:

A. User Account: The unique *One Game* identity that allows players to login through their username and password.

As a decentralized platform, *One Game* requires no KYC (know-your-clients), although local agencies or promoters can add their own rules to ask users for personal information in order to prevent children from using the software depending on geographically-based restrictions.

B. Land System: The sets of land on which users create game scenes.

The system can generate unlimited amounts of virtual land with sizes ranging from 2K pixel*2K pixel to 2M pixel*2M pixel. A developer needs to pay a small fee in order to generate new parcels of land.

Players can visit or enter any land in the platform, unless the developer requires tickets to be purchased or makes entry invitation only.

A map editor allows developers to create new landscapes and edit heights. All land is disjointed by default, but

developers can collaborate and agree to connect their respective parcels of land.

C. Game Assets: All the visible entities in the world of *One Game*, including human characters, animals, vehicles, and buildings.

Players can get free or paid assets from the **Asset Store**, while developers can create new assets, and either sell or share them for free in the Asset Store.

D. Avatars: The players' graphical representation in the virtual world of *One Game*.

Adam and Eve are the default choice of avatars when new players enter the game, and additional avatars can be obtained from the Asset Store.

By controlling the avatars, players can walk around the world of *One Game*, and play different games created by different developers.

Beyond the characters controlled by the players, there are numerous NPC (Non-Player Characters) in the platform. These avatars become alive with the help of AI algorithms, and can join different games made by developers.

E. Scripts: Help developers define customized rules on their land as well as generate new games.

Developers can use scripts to override the default physical rules in the platform, create plots or stories, make NPCs

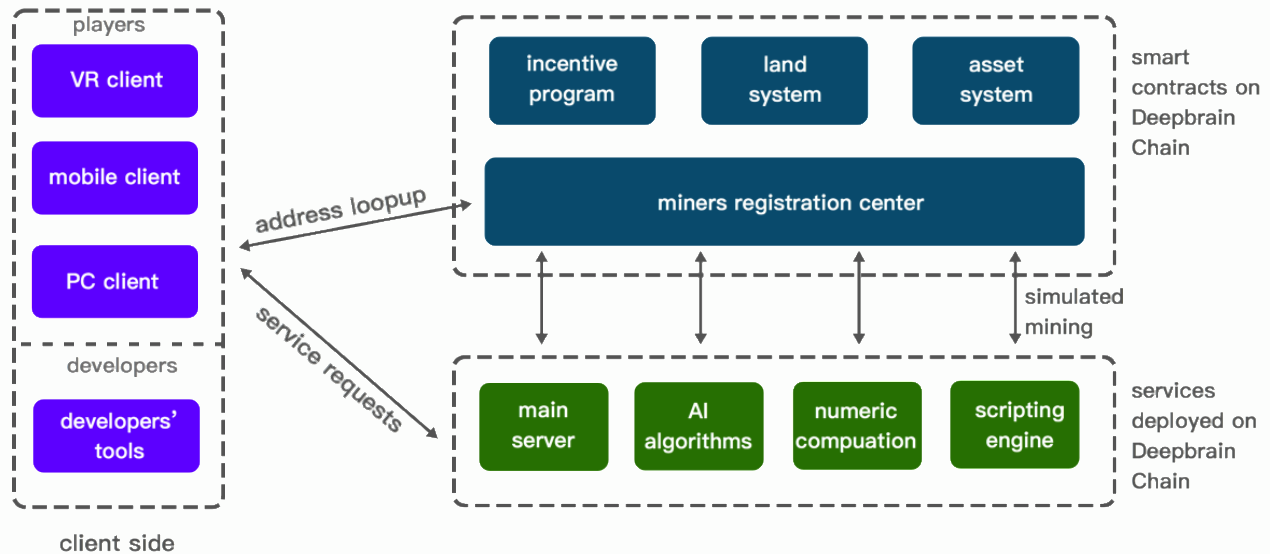
alive through AI algorithms, or define the starting and ending conditions of games.

F. Lobby: The starting point from which players discover or search for land owned by developers, and enter the scenes or the games created on top of these varied land.

The Lobby also enables basic communication functions, and allows players to chat with developers or keep in touch with other players.

3. Technical Architecture

The *One Game* platform contains a client side and a server side.



The client side is the interface that connects the real and the virtual world and consists of a game interface for the players, and developers' tools for developers. Initially, we will launch a PC version, which will be followed by mobile and VR devices.

The server side is built on top of Deepbrain Chain, which is a low-cost, private, flexible, safe, and decentralized computing platform.

And it includes two parts: smart contracts on Deepbrain Chain, and mining services on Deepbrain Chain's computing platform deployed by miners. Anyone can become a miner by downloading One Game's code from the online repository, and uploading the compiled the binary to Deepbrain Chain's computing platform. This way, miners provide computing and

storage resources to One Game through Deepbrain Chain, and get rewards through the simulated mining process.

All key judgment and logics are implemented in the server side. The game client only conducts rendering and computations that don't affect the game results.

A. Selection of Game Engine

Ideally, we want to have an implementation entirely based on open sourced solutions; however, most commercial game engines are closed source.

For now, we choose Unity3D, and we will open-source all of the code and the communication protocols. Ultimately, when there are better choices, we will migrate to a new solution.

B. Developers' Tools

Game creation in the *One Game* platform will be facilitated through the following developers' tools:

- Land Editor: alters the land's elevation and landscaping.
- Assets Editor: creates and modifies non-avatar game assets.
- Avatar Editor: creates and modifies avatars.
- Scripts Editor: edits scripts, in order to control properties and events related to land, assets, or tasks.

Our goal is to enable new developers with zero experience to make great games, as well as provide advanced options

to allow professional developers to make the best use of the platform.

C. Smart Contracts on Deepbrain Chain

One Game's core value system is built on top of Deepbrain Chain as smart contracts.

It contains the following key components:

- Miner's Registration Center, where miners register themselves, and service requests from the client side are routed to the mining services.
- Incentive Program, manages how token rewards are generated in the whole system, and how they are distributed to miners, developers, and players.
- Land System, keeps the full records of land creation, ownership, and pricing history.
- Asset System, traces the status of all the game assets, including the status of the avatars, and adopts the ERC-721 standard. Every single asset in the world of One Game is non-fungible, and carries a unique id.

D. Services Hosted on Deepbrain Chain

In the simulated mining process, miners deploy various services to Deepbrain Chain's computing platform:

- Main Server, includes fundamental components of the system, for example, game lobby, asset store, scenes.

- AI Algorithms, include algorithms for pathfinding, and the behavior and decision making of the NPCs.
- Numeric Computing, manages game physics and collision detection.
- Scripting Engine, compiles and executes scripts created by developers.

When the client side needs to send requests to the server side, it first looks up for the corresponding service's IP address from Miner's Registration Center, and then sets up a peer-to-peer connection with the service.

When the requests from the client side exceeds the capacity of the existing miners, the Incentive Program will raise the mining rewards, to attract more miners. On the contrary, when there are not enough requests, the Incentive Program will lower the mining rewards, which will decrease of number of miners, to save energy.

E. Version Management and Security Mechanism

In One Game's mining process, anyone can become a miner without any permission, which means, miners have the freedom to host different versions of the service, and they can even provide compromised ones.

To solve this problem and protect the system from potential security hazards, on one hand, we record all the binaries' fingerprints, and register them in the Miner's Registration Center; on the other hand, a voting process is designed, so that developers and players can form a committee and

decide which version is the elected one. The theory of the voting process is explained in detail in section 4.

The computing platform of Deepbrain Chain, also guarantees that once a version is deployed, it will be kept in a sandbox safely and won't be modified by any external program.

4. Self-evolvment of the Platform Based on Genetic Algorithms

Developers will provide high volumes of assets and scripts to the platform over time, while players will provide an ongoing stream of data through game play. *One Game* is highly modularized, and we believe the combination of different modules will generate unlimited gaming possibilities and variations.

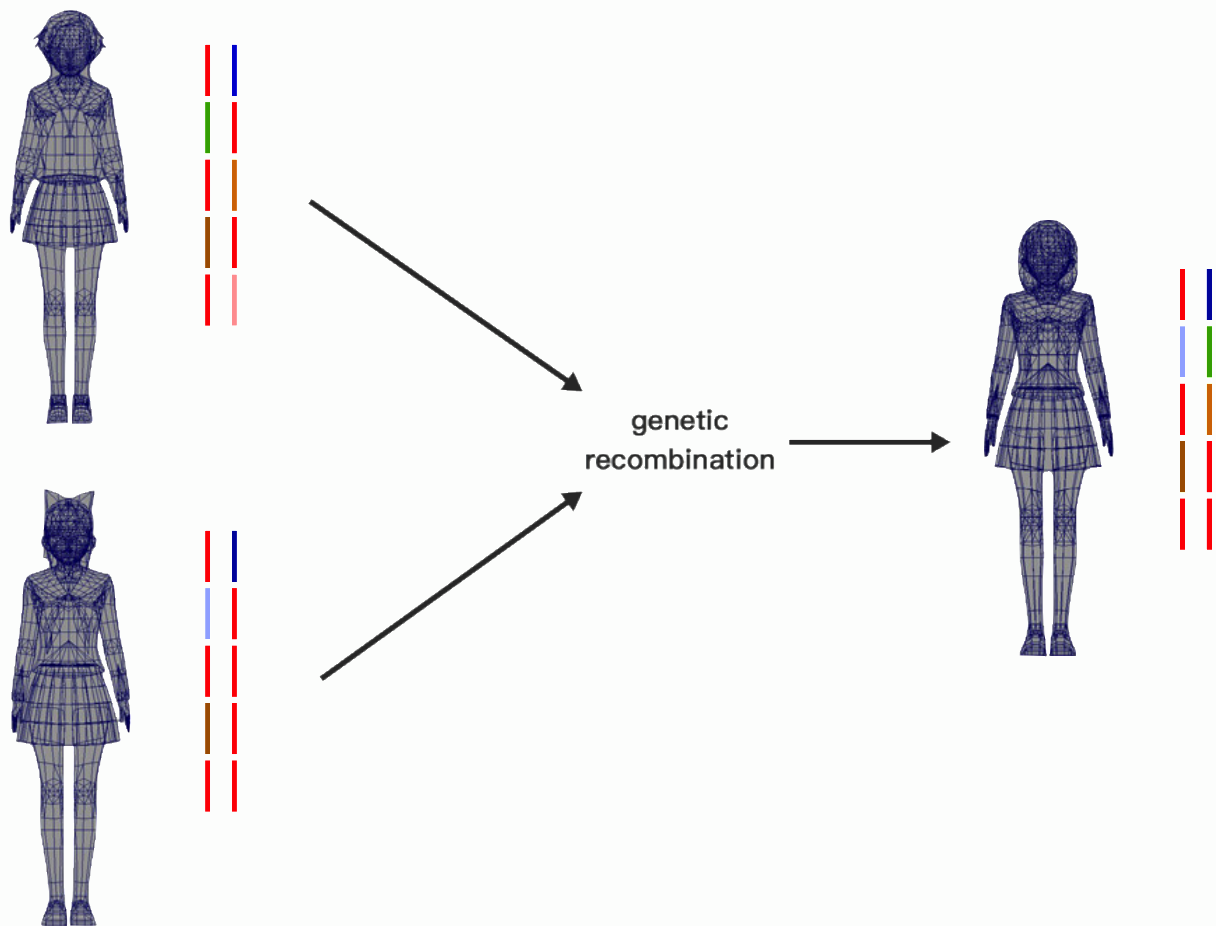
One Game's developer tools allow developers to map asset modules with genes, similar to that of DNA - every pair of genes carry a trait.

By paying a fee, players can apply random genetic mutations or combinations onto assets owned by them to acquire new assets. And they can continue the process until they happy with the generated content.

After multiple rounds of developers' and players' input and feedback, the genes will allow the platform to evolve with

surprising results via this selection process. *One Game* grants players and developers godlike powers of creation.

One Game's self-evolving genetic algorithm combines knowledge in biology, mathematics, and computer science. As the platform evolves, we will further develop the theory and publish new papers.



Example of genetic recombination and mutation of two avatars

* internet images for demo purposes only

5. Consensus in *One Game*

Decentralization relies on consensus, and *One Game* will use *Popularity Rank* (R_p) and *Competitiveness Rank* (R_c) as a consensus mechanism. R_p and R_c measure the activeness of developers and players, and the platform will periodically re-compute PR and CR for each developer and player.

These two consensus mechanisms enable decentralized governance and a self-evolving platform based on voting:

A. Popularity Rank, defines the popularity of the land created by developers.

$$R_p(l, i + 1) = k \sum_{p \in P} \frac{t(p, l)}{T(p)} + (1 - k)R_p(l, i)$$

Here, $R_p(l, i + 1)$ and $R_p(l, i)$ respectively represent a land l 's Popularity Rank in the current period (period $i + 1$), and the previous period (period i); k is a number between 0 and 1, and represents the weight of the current period; P is the set of all the players that visited land l in the current period, and p represents a single player; $t(p, l)$ represents the time that a single player p spent in land l , and $T(p)$ is the time that player p spent in all the land in the current period.

$$R_p(d, i) = \sum_{l \in L(d)} R_p(l, i)$$

A developer d 's Popularity Rank $R_p(d, i)$ equals to the sum of all of his land' Popularity Ranks $R_p(l, i)$, where l represents a single land, and $L(d)$ is the set of all the land created by d .

B. Competitiveness Rank, defines players' performance in different games created by developers.

$$R_c(p, i + 1) = k \sum_{l \in L} R_p(l, i) \frac{s(l, p)}{S(l)} + (1 - k)R_c(p, i)$$

Here, $R_c(p, i + 1)$ and $R_c(p, i)$ represent a single player, p 's Competitiveness Rank in the current period and the previous period; k is a number between 0 and 1, and represents the weight of the current period; L is the set of land that player p visited in the current period, and l represents a single piece of land; $s(l, p)$ represents a single player p 's performance score in land l , and $S(l)$ presents the sum of all the scores from different players in land l .

Please take note that the popularity rank $R_p(l, i)$ of the previous period is used as a weight in the formula. In other words, players need to gain scores in more popular games in order to better increase their Competiveness Rank.

C. Version Upgrade Based on Proof of Popularity and Proof of Competitiveness

The platform will choose N_p developers with the highest Popularity Rank, and N_c players with the highest Competitiveness Rank as the judges to form a committee.

When the One Game development team updates the platform, it will be presented through smart contract to the committee, who will make the new version official upon 2/3 of the judges' approval.

Theoretically, third party developers can also develop new versions and submit them. Eventually, it's the committee that decides how the platform upgrades.

6. A Tokenized Ecosystem on Top of Blockchain

Game credit is a natural component in games. In the virtual world of *One Game*, we want to further explore the usage of blockchain based tokens as game credits:

A. Introducing *OGT* (*One Game Token*)

One Game Token (*OGT*) is an ERC20 compatible token issued on top of the Ethereum blockchain. There is a finite supply of *OGT*, and the amount in circulation will be pre-defined.

If we migrate *One Game* to other public permission-less blockchains or launch our own main-net in the future, *OGT* will be converted into new tokens as well.

B. *OGT* Usage

The following summarizes the varied *OGT* utility:

- Creating and maintaining land
- Paid options in games developed by developers
- Buying and selling assets in Asset Store
- Rewards for top performing developer and players
- Fees for using computing and storage resources

C. Incentive Program

There is an incentive pool reserved for the miners and all the developers and players. And every year, 10% of the tokens in the pool will be distributed as rewards. And in the other direction, the proceeds received from land creation and genetic mutation will be returned back to the pool. Eventually, it will reach a dynamic balance.

As described in section 3.D, the simulated mining process guarantees that there are always necessary but not excessive computing and storage resource provided in the whole system, and miners get enough incentives. The remaining rewards will be then distributed to developers and players, with an amount proportional to their Popularity Rank and Competitiveness Rank.

D. *OGT* Pricing Mechanism

The conversion rate between *OGT*, fiat, or other cryptocurrency is decided purely by supply and demand.

The *OGT* price will go up when more developers and players join the platform because there is a limited number of *OGT*.

Although the *OGT* price is variable, developers will occasionally need to issue game credits with a fixed conversion rate to fiat currencies.

We provide a protocol that developers can refer to one or multiple oracles that connect to the APIs of major cryptocurrency exchanges, and grant developers access to the current *OGT* price to solve this problem. Developers can then issue game credits based on variable *OGT* conversion rates while maintaining a stabilized price bounded to fiat currencies.

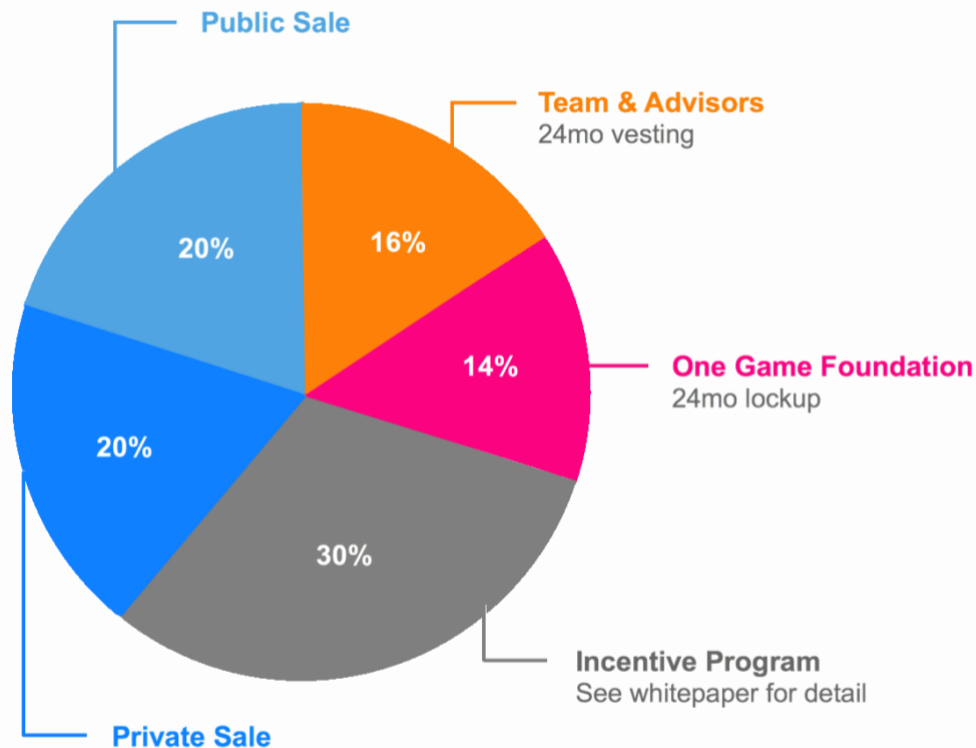
For example, if the current price of one *OGT* is \$0.01, and a game developer issued his own game credit *X* set at a single credit price of \$0.1, then in *One Game* players need to pay 10 *OGT* to get one *X*.

When the token *OGT* price increases to \$0.02 the developer can easily change the conversion rate and allow players to receive one *X* with 5 *OGT* through use of the oracle.

Currency fluctuation is a risk for developers because they earn *OGT* from the games, and the token price may go down due to market changes. We suggest developers hedge this fluctuation risk through use of derivatives. Due to the ancillary complexity of this market, we will not go into detail here.

7. *OGT* Allocation

There are 10 billion total *OGT*, and are allocated in the following way:



- 16% of the *OGT* will be reserved for the team and advisors, vested linearly in 24 months.
- 14% of the *OGT* will be reserved for the *One Game* Foundation, with a lockup period of 24 months.
- 30% of the *OGT* will be reserved and need to be mined. Half of the block rewards will go to players.
- 20% of the *OGT* will be sold to strategic partners in the private sale.
- 20% of the *OGT* will be sold to future gamers in the public sale.

8. Project Roadmap

One Game's roadmap:

Q4 2017 Concept development White paper	
	Q1 2018 Product Development White paper
Q2 2018 Private sale to strategic partners	
	Q3 2018 Launch beta version – Wild Field Launch developer's tools Public sale to future gamers
Q4 2018 Launch version 1.0 – Muddy Farm Build a fundamental virtual world	
	Q1 2019 Launch version 2.0 – Light City Create an improved ecosystem Attract more developers
Q2 2019 Launch version 3.0 – Dream Land A world governed by developers and gamers, and a self-evolving platform	

9. Team

Our executive team are entrepreneurs and engineers from tier 1 companies and schools in Silicon Valley and Wall Street.

Chief Executive Officer | Pu Shi

Serial entrepreneur and early adopter of crypto currency. Investor and adviser in multiple blockchain projects. Independent game developer with more than 10 years' experience. Co-founded Carloha, a leading used car e-commerce company based in New York. Has held Senior Software Engineer and Tech-lead positions for multiple years in technology companies, including Google and Microsoft. M.S. of Computer Science from Emory University.

Chief Blockchain Engineer | Jason Zou

Tech Lead and Manager on Google Maps. 7+ years of experience working on Google Maps using industry-leading AI technologies. Holds Ph.D. of Applied Mathematics from Stony Brook University and Bachelor of Pure Mathematics from Wuhan University. Former ACM-ICPC programming contest medalist.

Chief Producer | Kurt Young

Co-Founder and Creative Director of Mokuni Games. Former Creative Director of The9 Limited (NASDAQ: NCTY). M.S. of Computer Arts from School of Visual Arts.

Chief Technical Artist | Fox Chen

Co-Founder and Lead Programmer of Mokuni Games. Had more than 10 years' experience game development. M.S. of Computer Science from New York University.

Chief Strategy Officer | Jeff Zhou

Investment banker with 10+ years of experience in M&A and IPO. Specialty areas include fintech and clean tech. Obtained Bachelor's degree in Mathematics and Economics from Macalester College, USA and MBA degree in Finance from Simon Business School, University of Rochester.

Business Development Director | Anthony Andreoli

Broad business background including experience in the legal, entertainment, digital media, and commercial real estate industries. Experience includes work with boutiques as well as large institutional firms including Dechert LLP, CAA, and Cushman & Wakefield. Graduated cum laude from the Wharton School of the University of Pennsylvania, and holds a JD from Villanova Law School as well as an LLM from Temple's Beasley School of Law.

Mokuni Games, based in New York, is an important partner of *One Game*. And the team of Mokuni Games is an important part of the *One Game* team.

In the past 5 years, with a team of more than 10 members, Mokuni Games developed and published multiple successful products, including Kitty in the Box, and Food Conga, both of which were featured in the app stores of Apple, Google, Microsoft, and Amazon multiple times. The games received more than 10 million downloads, with an average review score of 4.5+. Additionally, Mokuni Games has received awards from New York Comic Con and PAX multiple times. The company recently provided a Virtual Reality experience for Tesla's flagship store in China in Q3 2016.