XYO Network in Automated Drone Technology

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Abstract

There has been significant buzz recently around drone technology and the role it will play in our future. From emergency medical supply delivery to one-hour eCommerce delivery, advancements in drone automation bring these applications closer to reality each day. This raises very valid and practical questions for both the entities that will use drone technology and those affected by it. Where will the drones be able to fly? How will accidents be prevented? How will package delivery be confirmed? The XYO Network (XY Oracle Network) can provide independently verified location data that can help keep drones within approved flight paths, avoid collisions with both moving and stationary objects, and report package location at key points. According to Amazon CEO Jeff Bezos, the platform's current plans for delivery confirmation require the customer to print out their own pre-generated symbol from a physical printer [1]. The XYO Network provides trustless location verification that eliminates this requirement, making the overall process and user experience smoother for the customer. The integration of the XYO Network's unique blockchain technology will maximize the efficiency of the implemented drone systems, which is imperative for all newly-established industries to thrive and scale.

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1 Problem

Numerous entities are very close to implementing automated drone services, from eCommerce giants like Amazon and Walmart to Google/Alphabet's Project Wing to the numerous drone mapping services already in operation. Ensuring public safety, securing personal privacy, and maintaining compliance with FAA regulation will become increasingly challenging as guidelines are altered and skies become more crowded.

2 Solution

By utilizing the XYO Network, automated drones operating independently of each other will be able to communicate their relative and absolute locations using a universal protocol. Drones that are not inherently able to communicate with one another can take advantage of the XYO Network and still interact through third-party intermediaries, including independent devices or other drones. Interactions between devices on the XYO Network are also recorded on the blockchain, a decentralized ledger. This means that all automated drones are held publicly accountable in the event of an accident, regulation infringement, or breach in safety or personal privacy through the availability of a permanent and unalterable record of all device interactions.

3 How it Works

Every drone that is connected to the XYO Network will include a device called a Sentinel. Sentinels record and transmit heuristic data like time, location, speed and temperature. They also communicate with other Sentinels and keep a record of these interactions. This history is transmitted to the blockchain via an XYO Bridges, which can either be included on the drones themselves, or as independent devices. The entire history of heuristic data and device interactions is archived on a decentralized, publicly accessible blockchain.

Drones operated by different companies or produced by different manufacturers may very likely lack a universal standard of wireless communication necessary to communicate directly with each other. The XYO Network is platform-agnostic and is not tied to any one radio broadcast band or communication protocol. This means that Bridges can act as middlemen between devices that would otherwise not be able to correspond with each other. Devices on the XYO Network can help improve each other's data, allowing for greater accuracy among all drones. For example, if one drone uses GPS for location calculation, and another triangulates off of cell towers, comparing their data at the time of interaction will independently verify both devices' histories. A device on the XYO Network that doesn't have an independent geo-positioning system will also be able to use the drones' heuristics to confirm its own location.

Participation in the XYO Network is incentivized by XYO Tokens - Sentinels and Bridges are awarded XYO Tokens when the accurate information they provide to the XYO Network is accessed, as well as other devices on the XYO Network that are responsible for archiving and analyzing the data that is provided.

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References

[1] Nickelsburg, Monica. *Jeff Bezos: Amazon Drones Will Find Landing Spots Using Symbols Printed Out By Customers.* GeekWire, October 24, 2016.

Glossary

accuracy A measure of confidence that a data point or heuristic is within a specific margin of error. 2

Bridge A Bridge is a heuristic transcriber. It securely relays heuristic ledgers from Sentinels to Diviners. The most important aspect of a Bridge is that a Diviner can be sure that the heuristic ledgers that are received from a Bridge have not been altered in any way. The second most important aspect of a Bridge is that they add an additional Proof of Origin metadata. 2

heuristic A data point about the real world relative to the position of a Sentinel (proximity, temperature, light, motion, etc...). 2

Sentinel A Sentinel is a heuristic witness. It observes heuristics and vouches for the certainty and accuracy of them by producing temporal ledgers. The most important aspect of a Sentinel is that it produces ledgers that Diviners can be certain came from the same source by adding Proof of Origin to them. 2

trustless A characteristic where all parties in a system can reach a consensus on what the canonical truth is. Power and trust is distributed (or shared) among the network's stakeholders (e.g. developers, miners, and consumers), rather than concentrated in a single individual or entity (e.g. banks, governments, and financial institutions). This is a common term that can be easily misunderstood. Blockchains don't actually eliminate trust. What they do is minimize the amount of trust required from any single actor in the system. They do this by distributing trust among different actors in the system via an economic game that incentivizes actors to cooperate with the rules defined by the protocol.. 1

XY Oracle Network XYO Network. 1

XYO Network XYO Network stands for "XY Oracle Network." It is comprised of the entire system of XYO enabled components/nodes that include Sentinels, Bridges, Archivists, and Diviners. The primary function of the XYO Network is to act as a portal by which digital smart contracts can be executed through real world geolocation confirmations. 1, 2