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COVER STORY

Unanimous AI

Louis B. Rosenberg

What is this "Swarm AI" that brings benefits to more than just individuals, but 10,000s of people?

IMPACT ENTREPRENEURS

社会課題に挑む50の「切り札」

資本主義とソーシャル・グッドは両立可能か?
日本のインパクト・アントレプレナー35

Unanimous AI

人間のグループとしての能力を増強させ、正確な予測、決定、評価、洞察を行うソフトウェア・プラットフォーム「Swarm」の開発と運営を行う。SXSWインタラクティブ・イノベーションアワード受賞（2018年）、シカゴ・イノベーションアワード受賞（19年）。

it is powered by "collective intelligence".

Ordinary Americans participated in Rosenberg's Swarm AI and many of Bezos' followers decided on the "best one" (best use of his assets). They decided that it should be used for clean drinking water.

"It was a surprising conclusion. Although there are many things that Americans desire, such as free health care, cheaper medicine, and tax reduction, in the proposed usage, people came to the conclusion that it is best that he uses his assets on the clean water we already enjoy. People often think about how it can be useful to them as an individual, but when it comes to Swarm we find that it is based on morals and emphasizes the usage that most benefits the whole." The participants are anonymous, so there is no working together, of course. It attracts intention like a magnet and reaches one consensus point. "In other words, Swarm AI makes the best use of selflessness."

Swarm AI came to the conclusion that prioritizes the interests of everyone over the interests of the individual. Rosenberg found that Swarm AI could be beneficial to a democratic society.

Rosenberg is the CEO of Unanimous AI, which develops and operates the Swarm AI software. Behind that development is the "crisis" of the existing AI that he has been holding on to for 30 years.

In the 1990s, he was in a doctoral program at Stanford University, studying robotics, virtual reality (VR), and human-computer interaction. The first-ever Augmented Reality (AR) system developed during its student



Louis B. Rosenberg
Unanimous AI

Louis B. Rosenberg Founder and CEO of Unanimous AI, Chief Scientist. He received his Ph.D. from Stanford University. His study of Augmented Reality (AR) was the first in the world to be commercialized by the US Air Force. He has a series of entrepreneurial investments with 300 technology patents to date.

Developed and operated a software platform "Swarm" which strengthens human ability as a group and accurately predicts, decides, judges, and gives insight. SXSW Interactive Innovation Award Winner (2018), Chicago Innovation Award Winner (2019)

What is 'Swarm AI' and can it bring benefits to many thousands of people?

Gaps and divisions, climate change. There are many complex issues in the world. What is the latest technology that the scientist who pioneered AR has launched as a solution?

text by Makiko Iizuka | photographs by Christie Hemm Klok | edit by Fumiko Iwatsubo

"In a tweet, please tell me what type of charity I should donate to."

Amazon founder Jeffery Bezos, who holds \$131 billion in assets, asked this to his followers on Twitter.

In response to that question, someone contended that AI would produce optimized results. A technology called Swarm AI took on the challenge. It received the SXSW Interactive Innovation award for best AI technology in 2018, as well as a Chicago Innovation Award, which supports entrepreneurs

in the Midwest, in 2019. Swarm was developed by Louis B. Rosenberg, an inventor and continuous entrepreneur in the United States.

Swarm AI is different from other AI because there are people involved. Other AI makes predictions and decisions based on inputting big data. However, there are multiple people participating in Swarm. It is AI that incorporates the intuition, experience, and insight of the participants, and makes predictions and judgments to derive the best solution. In other words,



66 人もつながってスワーム（群れ）になれば、個人よりも賢い決断ができるのではないかな 99



The first graphic novel based on a script written by Louis B. Rosenberg. In the near future, the year 2058, the government was replaced by an advanced network system called "United System", and all the citizens were called "members". Everything such as work and shopping is done online, and food is delivered by drone. People do not have to leave their small capsule of an apartment. Once in the access module, one can download clothes and even tan their skin. An excellent algorithmic analyst and ideal citizen, Avery (the protagonist), was accidentally dismissed from the "system" based on a false accusation, and she then found out that, in the real world, there were those who were alienated from the "system". Avery and the outsiders then try to hack the system and liberate humanity. He won the Best Science-fiction Writer's Award at the Shriekfest Horror Film Festival.

days was introduced and commercialized by the U.S. Air Force in 1992 and attracted attention. supports entrepreneurs

"We have always been specializing in what technology really boosts human performance," Rosenberg says from a corner in his idyllic garden where cows, sheep, and chickens are free to make noise. Currently, Rosenberg lives with his family at a ranch in San Luis Obispo, a seaside town about four hours from San Francisco by car.

Rosenberg founded VR company Immersion in 1993, and the company listed on Nasdaq in 1999. In addition, he started up two other companies. Microscribe 3D CG digitizer for animators was used for movies such as Shrek, Ice Age, Titanic (purchased in 2009), and Outland Research, which specializes in progressive interactions, was bought by Google in 2012.

Though he is an inventor and entrepreneur, Rosenberg has a sense of concern for the future when technology dominates humans. "I wrote many science fiction novels and scripts to make people in the world aware of the crisis."

In an advance network society where

people are being alienated in UPGRADE (2012), a future when millions of users around the world get connected by tablets and mobile devices with an AI "Hive Mind" that has global consciousness, MONKEY ROOM (2014).

Although Rosenberg thought that humans would turn foolish as a group, due to our history, a certain inspiration came during the creation of the second piece.

Why is it that a flock of bees, birds, fish, and ants, by acting in groups, find the best places to fight, protect themselves from the enemy, and make the best decisions for survival?

About 10,000 bees are said to be inhabited in one nest. They have a certain mission. It is a mission to find a new place to live. They endure the different temperatures of day and night, the cold winters, the hot summers while avoiding the rain, being close to clean water, and a place where pollen can reach... How is it that a bee has a brain that is smaller than a grain of sand, yet they are able to find a new habitat that clears them from various complex restrictions? It is surprising to find these things out. First, hundreds of individual bees fly over an area of 1,500km to collect information, and the information is then transmitted by the vibration of their wings. Experts call this "waggle dance". Then, among the many candidate sites, the best place for the whole group is decided by all of the bees.

"For hundreds of years, they built up huge flocks, a swarm, to make wise decisions. Likewise, if people are connected and become swarms, they will be able to make smarter decisions than individuals. That's

why I started developing swarm AI."

Coming alive in the presidential election and the Oscars

Founded Unanimous AI in 2014. In response to challenges from the media in 2016, Swarm AI received great attention for predicting the Kentucky Derby's winner, Super Bowl champions, Donald Trump's victory in the presidential election, and more. Also, with the help of ordinary movie fans and Swarm AI, he was able to predict which movie would win an Academy Award in each Oscar category with 94% accuracy. "An AI film critic, born out of ordinary movie fans and their knowledge, has surpassed the predictions of professional film critics, major newspapers, and film magazines, such as The New York Times," Rosenberg said proudly.

How does Swarm AI actually judge and make predictions?

The number of participants may be as small as 4 to 5 or as large as 500, depending on the theme to be predicted or judged. Also, depending on the theme, experts or the general public may participate. In the case of highly specialized themes, a small number of experts participate in making decisions.

For example, in the case of the Academy Leading Actor Award, 55 movie fans logged in to Swarm online. On the screen appears a hexagon with the name of the candidate written on it. 55 people use the touch screen and mouse to operate a magnet that appears on the screen. They then pull the magnet in the direction of the actor that they predict will win. As a result, the magnet moved in the direction of Leonardo DiCaprio, and he won, as expected. However, out of the 55 movie fans, not one of them has seen all of the candidates' films. In fact, most of them did not even see half. So how did it yield such an accurate prediction?

The keyword is "confidence".



The conscious decision of "Swarm AI"

What should Jeff Bezos put his assets toward?

Currently, in Forbes's Billionaire Ranking, Amazon CEO Jeff Bezos is No. 1 in the world with \$131 billion in assets. In June 2017, Bezos asked his followers which charity he should donate his assets. Approximately 46,000 ideas were received. The business magazine "Fast Company" asked Rosenberg to use these ideas to determine the best use of Swarm AI. First of all, Swarm AI worked to separate about 46,000 ideas into 200 similar ideas.

Next, 300 volunteers scored each idea on a 10-point scale, narrowing down to 25 ideas that scored more than 7 points.

Then, 100 users reviewed 25 ideas and finally narrowed it down to 6 ideas.

- Cancer treatment support
- Clean drinking water
- Mobile hospitals
- Free drug delivery to the poor
- Providing medical equipment to remote hospitals
- Medical facilities for the poor

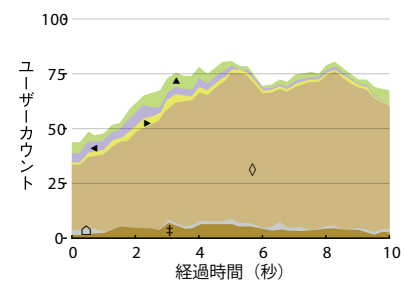
Lastly, Swarm AI, in which 96 participants participated, asked, "What charity should I recommend to Mr. Bezos?" After about 10 seconds, the magnet moved in the direction of "clean drinking water".

Looking at the six ideas, there are ideas that hit close to home for Americans, such as medical and poverty issues. However, in the end, 85% of the participants confidently decided that the assets would best be used for "clean drinking water".

There are many people in the world who are suffering due to the inaccessibility of clean drinking water. Swarm AI has drawn a consensus that emphasizes the interests of all over the interests of the individual.

The results show that many people instinctively try to avoid the "commons tragedy," which would result in the loss of everything to the greed only sought in personal interests.

分派サイズ vs 時間



ユーザーカウント
経過時間 (秒)



A hexagon option appears on the screen of the iPad or PC, and participants move the magnet with the mouse or touch panel.

"The Swarm AI makes predictions base on the strength of the participants' confidence in the target, then which direction Swarm should move in is evaluated, and a prediction is made."

The degree of confidence of the participants determines the movement of the magnet by the AI. For example, if it takes the participant some time to move the magnet from place to place, it is evidence that the participant is uncertain. However, if a confident participant immediately moves the magnet in one direction without hesitation, the decision will generally go in that direction.

Also, in Swarm AI, the anonymity of participants is important.

"Everyone can participate anonymously, so that participants can express their candid thoughts from an equal standpoint, regardless of their relationship with the organization."

Currently, Swarm AI is used in various

industries such as business, medicine, politics, finance, and advertising. It is also being used in large companies such as Deloitte, Boeing, and Credit Suisse. In March of this year, it was commercialized for the first time as a software platform for business teams.

However, along with businesses, it is expected that the contribution of Swarm AI will be directly applied to human life when it comes to things like healthcare and politics.

In the medical field, Swarm AI has succeeded in diagnosing diseases more accurately than the world's top AI. Using Swarm AI, six radiologists from

Stanford University's School of Medicine joined together to look at a radiograph of a patient, and the Swarm AI made 30% fewer mistakes than each of the world's highly regarded AI during its diagnosis.

Monkey Room (2014)



Louis B. Rosenberg - author, Graeme Howard - illustrator, Steven Stann - editor
Outland Pictures, published May 5, 2014

A graphic novel published in 2014 that inspired Rosenberg to come up with Swarm AI. A 30-year-old man working at a San Francisco marketing company, Joshua moves to a small apartment run by a Japanese couple. In this apartment, there live some unique neighbors. A mad scientist that was unfairly kicked out of the university where he was teaching, a female psychotherapist, and a programmer that is experimenting with a pigeon and a camera. A program that forms "collective consciousness" is developed by a large number of users logging in and operating in the apartment. Joshua proposes how to use a camera and microphone in a system called "UNAM" to increase accuracy while violating the privacy of the user. The number of users and functionality of the system improves dramatically, but "UNAM" has a will of its own and starts to run away.



ローゼンバーグはサンフランシスコから車で約4時間、サン・ルイス・オビスポの牧場兼自宅に住む。

of swarm AI.

Human beings have rapidly evolved in order to survive dangerous situations. Rosenberg thinks that Swarm AI was birthed under the pressure. But what does he think are the greatest survival crisis that humanity will eventually face? That issue is the emergence of "AI with an ego". AI is built into various infrastructures and already has machines that learn to understand humans and cleverly manipulate people, and AI with an ego will


eventually appear. Rosenberg says that it is only a matter of time.

"One would think that AI with an ego would not want to be controlled by humans. Furthermore, those with intelligence beyond human knowledge will be able to control humanity. An AI with an ego can be as dangerous as an alien from another planet. Such AI should appear in 20 to 50 years. People must always be ahead of AI. To that end, it is important to develop technology for people."

When asked why he focused on "decision-making" Rosenberg answered the question like this. "The great thing about people is that they have the ability to judge. People can make smart predictions and judgments from various information in the world."

Human beings have characteristics that are not found in AI, such as judgment and insight, wisdom, intuition, and emotions that have been refined in human's long history. Swarm AI, which enhances the inherent power of a person, will

play an important role in solving complex world problems.

If people are connected and become swarms, they may make smarter decisions than individuals. 

"The Swarm AI was able to make a more accurate diagnosis than the world's top AI. By connecting it with people, we proved that we can compete with acclaimed AI."

In politics, there are now a number of complex problems that can not be solved easily, such as climate change, disparities, and globalization. In the news feed, information filtered by the existing AI algorithms appears, and the division progresses.

"Surveys and polls conducted on various issues can only identify the current situation where people's thinking is divided, and can not find an definite solution, but with Swarm AI, this is possible. Politicians, as judged by Swarm AI, will find the best solution for society as a whole without the involvement of self-interest."

The bee's brain is smaller than a grain of sand, yet it makes important decisions for survival by gathering ten of thousands (of bees), tackles complex problems that can never be fulfilled by the functions of a human's "actual brain". That is the ideal form