

Cognitive Research Lab Launches Free Provision of Innovative AI Emergency Communication Network "RescueLink"

~Protecting the lives of citizens during disasters and in situations where communication infrastructures and GPS are blocked~

Cognitive Research Lab Co., Ltd. (Headquarters: Minato-ku, Tokyo, CEO Hideto Tomabechi) has started offering for free the "RescueLink" AI mesh emergency communication network feature within the iOS app "Cognitive FortTalk".

"Cognitive FortTalk" is a next-generation social networking app designed with the utmost importance placed on privacy and security. By adopting the latest encryption technology, advanced multilingual translation capabilities, and cutting-edge AI technology, it provides users with a safe and comfortable communication experience. Additionally, it promotes efforts towards building a better society, such as social contribution activities, realization of direct democracy, supporting high-quality journalism based on real-name systems, and introducing an original economic model called "halving currency".

Within "Cognitive FortTalk", the "RescueLink" feature is particularly noteworthy. RescueLink was developed with the aim of protecting the **lives of citizens** from the destruction of communication networks due to **disasters, emergencies, cyber terrorism, and large-scale power outages**, and to avoid **national crises**. Unlike traditional centralized communication networks, RescueLink employs a **decentralized network structure**. It utilizes **Wi-Fi routers** (supporting local communication even when the network is disconnected), **Bluetooth, device-to-device P2P Wi-Fi** (technology that allows devices to communicate directly with each other via Wi-Fi), and **UWB (Ultra Wideband)**, with **AI** automatically constructing **mesh networks**. This enables communication between individual devices even when the central network is non-functional.

This system allows all devices to connect to multiple devices **simultaneously**, and through **multipoint connections, multiple pathways, and redundancy**, it provides **resilience (recovery and elasticity)** to protect lives in constantly changing situations. Furthermore, using UWB technology for **real-time high-precision location measurement**, it constantly updates the relative distances and directions between users. UWB is a low-power, high-bandwidth wireless communication technology that enables high-precision location measurements. Especially in urban areas during emergencies, it provides **rapid and accurate location information** to assist in quick actions at disaster sites, such as rescuing people trapped under collapsed buildings and quickly transporting injured persons.

Additionally, through **advanced encrypted connections**, it enables completely **P2P encrypted communication** without the need for Wi-Fi routers, even in situations where secrecy is required during emergencies or anti-terrorism efforts. P2P communication, which involves direct communication between devices without a central server, shares the fundamental concept with blockchain technology in that it does not require a centralized administrator and each device operates autonomously. **Blockchain technology** is known as a remarkable technology that enables decentralized data management.

By offering RescueLink for free, Cognitive Research Lab provides an innovative solution to ensure the safety of citizens in emergency situations and overcome national crises. We are confident that this advanced technology will greatly contribute to saving lives and enhancing the resilience of society. RescueLink is a technology that expands the **possibilities of communication** not only as a means of communication in crisis situations but also in everyday life. For example, it is expected to be used in areas with fragile communication infrastructures such as mountainous regions and islands, and to alleviate congestion during large-scale events. Through this technology, we aim to protect citizens from the threats of disasters and emergencies and realize **a safer, more connected society**.



emergencies but also to bring innovation to everyday life communication. For example, the sharing of high-precision location information utilizing UWB technology can greatly benefit everyday activities such as navigation and meeting up with people. It is the technological foundation of RescueLink that makes these wide-ranging application scenarios possible.

Supporting Advanced Technologies of RescueLink

RescueLink combines multiple advanced technologies to enable rapid and effective communication during disasters and emergencies. Moreover, these technologies hold the potential to improve the convenience of communication even in normal times. Here, we will detail the key technologies supporting RescueLink.

1. Automatic Network Construction by AI

It autonomously constructs a mesh network without depending on radio towers or internet infrastructure. By utilizing AI technology, each device autonomously selects the best connection point and constructs the network. This allows for efficient operation of communication networks with minimal human intervention. Furthermore, this technology, in conjunction with UWB technology, realizes network construction utilizing high-precision location information.

2. Real-time High-precision Location Measurement by UWB

By leveraging cutting-edge UWB technology, RescueLink achieves real-time high-precision location measurement. UWB technology updates the relative distance and direction between users in real-time. In the event of a disaster in urban areas, this function provides rapid and accurate location information, supporting quick actions at disaster sites, such as rescuing people trapped under collapsed buildings. Compared to GPS technology, UWB achieves higher accuracy in indoor location measurement. Additionally, by working in conjunction with automatic network construction by AI, it enables more efficient operation of communication networks.

3. Combined Use of Wi-Fi and Bluetooth

RescueLink skillfully uses both Wi-Fi and Bluetooth to support wide-area communication. Wi-Fi functions using radio waves alone and does not require an internet connection, making it operational even when communication infrastructures are damaged. Bluetooth operates with low energy and is suitable for continuous use. RescueLink integrates several proprietary technologies to optimally combine these technologies. This combination significantly contributes to the construction and maintenance of mesh networks.

4. Dynamic Mesh Communication Technology

It expands the communication range by relaying through nearby devices even when communication infrastructures are damaged. This technology optimizes the delivery of messages and chats, building an automatic and rapid emergency information transmission network. It is especially effective in environments where radio waves are difficult to reach, such as underground malls and high-rise buildings.

5. Sharing Location Information Without Depending on GPS

Even when GPS is non-functional, RescueLink can share users' location information. This feature supports rescue operations during disasters and navigation to shelters, facilitating efficient rescue efforts. The integration with UWB technology allows for the sharing of more precise location information.

6. Multipoint Connection Functionality

RescueLink supports multipoint connections, allowing simultaneous connections with multiple devices. This feature enables rapid and extensive communication during disasters. For example, rescue workers can use multiple devices to communicate simultaneously with victims and other team members, significantly improving the efficiency of rescue operations. The multipoint connection functionality, in conjunction with dynamic mesh communication technology and AI-driven automatic network construction, provides a more robust communication foundation.

The **seamless** integration of these advanced technologies enables RescueLink to deliver exceptional performance. The coordination between AI-driven automatic network construction and UWB technology, the combined use of Wi-Fi and Bluetooth with dynamic mesh communication technology, and the integration of GPS-independent location sharing with multipoint connection functionality—these technologies complement each other to ensure reliable information transmission during disasters and emergencies.

The advanced technologies behind RescueLink have the **potential to dramatically transform disaster response**, offering a **higher level of protection for the lives and safety of people around the world**. This revolutionary tool will play a crucial role in safeguarding the lives and safety of citizens during emergencies. Cognitive Research Lab is committed to further improving these advanced technologies to achieve more effective emergency communication. RescueLink will continue to innovate, providing cutting-edge solutions to protect the lives and safety of people worldwide.



RescueLink's Advanced Technology as a Strong Foundation for Protecting Lives During Disasters and Emergencies

RescueLink's cutting-edge technology serves as a robust foundation for saving lives during disasters and emergencies. But how exactly do these technologies play a role in real disaster scenarios, and how can they protect people? Here, we will introduce some of the specific roles that RescueLink can play during disasters.

Roles of RescueLink During Disasters

1. Emergency Communication Immediately After a Disaster as a Lifeline

Emergency communication immediately after a disaster acts as a lifeline for victims. When communication infrastructures are severed right after a disaster occurs, RescueLink functions as an emergency contact network. Victims can use RescueLink to get in touch with family and friends for safety confirmations and to request rescues. The availability of such emergency communication means is essential for reducing the anxiety of victims and for facilitating more rapid rescue operations.

2. Supporting Efficient Rescue Operations

RescueLink provides support for rescue teams and volunteers to share information at disaster sites and to deploy rescue operations efficiently. By sharing real-time information about the situation on the ground and the locations of victims, it allows for the optimal use of limited resources and more strategic execution of rescue operations, thereby enabling the saving of more lives.

3. Essential for Information Exchange and Coordination in Shelters

In shelters or temporary relief bases, RescueLink becomes a crucial tool for exchanging information and coordinating efforts. It facilitates communication among victims and with support organizations, enabling smooth distribution of necessary aid and resources. Sharing issues and requests within shelters allows for more accurately addressing the needs of victims. RescueLink is indispensable for the operation of shelters.

4. Optimization of Communication Routes by AI for Effective Network Operation

RescueLink, through dynamic meshing of communication routes by AI based on signal strength, connection speed, power consumption, and other environmental factors, ensures the best possible communication pathways at all times, maintaining the stability and efficiency of communication. Utilizing AI allows for the operation of an effective communication network with minimal human resources, which is critical for maximizing the limited resources available during a disaster.

5. Enhancement of Data Sharing

By combining Wi-Fi and Bluetooth, RescueLink supports the sharing of large amounts of data and media files, enhancing information sharing and communication during disasters and allowing for a more detailed understanding of the conditions in affected areas. For example, sharing photos and videos of the disaster area can enable support organizations and decision-makers in remote locations to accurately understand the situation on the ground and implement appropriate aid measures. The data sharing capability of RescueLink significantly contributes to support for disaster-affected areas.

6. Providing Communication and Location Information Even When Communication Infrastructure is Disrupted

Even if cellular and internet networks are cut off, RescueLink still provides communication. Furthermore, even when GPS is destroyed, it can provide location information using UWB technology. This allows for more effective safety confirmations of victims and rescue operations. This role of RescueLink becomes a crucial key to saving lives when communication infrastructure is completely non-functional.

7. Optimized Combination of Communication Technologies for Any Situation

RescueLink optimally combines various communication technologies to create usable environments. This includes Wi-Fi routers during internet disconnection, Bluetooth, and direct peer-to-peer mesh connections between iPhones. This combination offers the flexibility and adaptability to handle any situation during a disaster, and by selecting the optimal communication method according to the situation, it minimizes power consumption and enables long-term operation. The combination of communication technologies in RescueLink forms the foundation for disaster-time communication.

8. Providing Precise Location Information Using UWB Technology

RescueLink offers high-precision location information utilizing UWB technology. By using this information, the exact locations of victims can be pinpointed, making rescue operations more efficient. It also allows for the provision of location information indoors, aiding in rescue operations inside collapsed buildings. This feature supports the swift rescue of victims and the safe operation of rescue teams.

These scenarios demonstrate the vital roles RescueLink plays during disasters and emergencies. Cognitive Research Lab aims to **save more lives** and **alleviate the suffering of victims** through the utilization of RescueLink. This new technology has the potential to significantly improve the efficiency and effectiveness of disaster response by **connecting victims and rescue teams, facilitating information sharing and coordination**. RescueLink is an indispensable tool for protecting lives during disasters and emergencies, and its full potential is realized through regular use and preparation.

[1]: Approximate reach of each communication technology: Wi-Fi routers (50m to several 100m outdoors), Bluetooth (about 10m), direct peer-to-peer mesh connections between iPhones (30m to 50m).

[2]: To utilize UWB technology, a device equipped with the U1 chip from iPhone 11 onwards is required. On devices with iOS 16.0 or later, UWB technology can provide estimates of distance, direction, horizontal angle, and vertical direction. Meanwhile, devices with versions earlier than iOS 16 can only obtain distance and direction.



As evident from the use cases of RescueLink, this technology plays a crucial role in critical situations and emergencies. However, to maximize its effectiveness, it's essential to become familiar with its features on a daily basis. Here, we'll explain some key points for utilizing RescueLink in preparation for disasters.

Utilizing RescueLink in Daily Life

1. Regularly Charge Your Battery and Prepare a Backup Power Source

During a disaster, power supply can become unstable. It's most important to regularly charge your device's battery and ensure sufficient power. Also, don't forget to prepare a backup power solution. Having a rechargeable external battery or a hand-crank charger ready can provide peace of mind in case of emergencies.

2. Keep Wi-Fi and Bluetooth Turned On

To effectively use RescueLink, it's crucial to keep Wi-Fi and Bluetooth on at all times. Wi-Fi signals have a long reach and can still be used if the internet connection is cut off, as long as a portable power source is available. The Wi-Fi feature of RescueLink is expected to significantly contribute to communication during disasters. On the other hand, Bluetooth operates with low power consumption, so it's recommended to keep it on at all times.

3. Minimize the Standby Power Consumption of the Cognitive FortTalk App

The Cognitive FortTalk app, which includes RescueLink, is designed to stay open in standby mode even when not in use. This design maintains readiness for immediate use when necessary. Furthermore, standby power consumption is minimized, allowing you to use the app without worrying about draining the battery.

4. Use the Cognitive FortTalk App Regularly

To use RescueLink without panic during a disaster, it's very important to get accustomed to using the Cognitive FortTalk app in normal times. By regularly launching the app and checking its functions, you can operate it smoothly when needed. It's also recommended to register each other as "friends" with those you wish to contact in emergencies. This ensures that emergency communications are faster and more reliable.

By taking these preparations, you can use RescueLink more effectively in emergencies. In the following section, we will discuss new features that Cognitive Research Lab is developing to extend the possibilities of RescueLink into daily life.



As evident from the use cases of RescueLink, this technology plays a critical role not only in emergencies and crises but also holds the potential to revolutionize everyday communication. For instance, it can be utilized as a means of communication in remote mountainous areas where signals do not reach, or for group communications at large-scale event venues. Cognitive Research Lab has conducted field tests in the Himalayas to explore further possibilities of RescueLink, actively advancing the development of new features based on the insights gained. Here, we introduce the future prospects of RescueLink.

Future Development of RescueLink

1. Field Tests in the Himalayas

Field tests were conducted in the Himalayas, an ideal environment for testing RescueLink due to the numerous areas without cell reception. These tests confirmed that RescueLink could facilitate communication between users even in the harshest environments where traditional signals cannot reach. This finding represents a significant step towards the future development of RescueLink.

2. Personal and Group Chats within Bluetooth Range

If at least one user is within Bluetooth range, it becomes possible to engage in personal or group chats through the mesh network. This functionality is incredibly effective as a means of communication in areas without signal reception. It is anticipated to be useful in various situations, such as mountaineers checking each other's positions or groups in shelters sharing information.

3. High-Bandwidth Mesh Communication When Connected to the Internet

If at least one user has an internet connection, high-bandwidth mesh communication becomes possible. This functionality allows for broader communication and significantly expands the range of information sharing. For example, in a mountain rescue scenario, if part of the rescue team has internet access, the situation on the ground can be relayed in real-time to the headquarters, facilitating accurate instructions and swift support.

4. Development of Dynamic Mesh Transceiver Functionality

Following the success of the field tests in the Himalayas, Cognitive Research Lab is developing a dynamic mesh transceiver function to further enhance the communication range and efficiency. This new feature will make RescueLink even more versatile for various scenarios.

For instance, in the event of a large earthquake causing building collapses and dividing rescue teams into multiple groups, the dynamic mesh transceiver function can maintain communication between groups, enabling coordinated and efficient rescue operations. Moreover, in mountainous regions where rescuers often spread out over a wide area, this functionality can facilitate smooth information sharing among team members, significantly improving the efficiency of the search.

Furthermore, the dynamic mesh transceiver functionality is not only for use in disaster situations but can also be utilized for regular outdoor events. For example, in large-scale music festivals or sports events where many participants are spread out over a wide area, organizers and operation staff can use RescueLink for communication, facilitating smooth event management.

Thus, the dynamic mesh transceiver functionality is one of the key technologies that expand the applications of RescueLink in various scenes, from rescue operations during disasters to everyday outdoor events. Cognitive Research Lab continues to evolve RescueLink into a more universally beneficial tool through the development of this new feature.

RescueLink has transcended its initial framework as an emergency communication support tool, playing a role in facilitating communication across various environments and situations. Cognitive Research Lab aims to fully leverage the **potential** of RescueLink to benefit society.

RescueLink holds the potential to significantly transform rescue operations during disasters. For instance, in the aftermath of an earthquake causing buildings to collapse, RescueLink can pinpoint the location of survivors and coordinate with rescue teams for quick extraction, dramatically improving the efficiency and effectiveness of disaster response. Furthermore, in everyday life, RescueLink **enhances people's interactions**. Whether it's connecting families living apart in mountainous villages or forming groups for communication at large events, RescueLink introduces a new means of deepening **human connections**.

Cognitive Research Lab is committed to exploring the future potential of RescueLink, providing people with **peace of mind, safety, and enriched communication**. We are dedicated to meeting your expectations through relentless research and development of innovative technologies. Cognitive Research Lab continues to strive towards creating **a society resilient to disasters and enriched with strong bonds**, led by the advancements of RescueLink.



■Company Overview

Name : Cognitive Research Lab Co., Ltd.

Representative : CEO Hideto Tomabechi

Location : 7-5-11 Roppongi, Minato-ku, Tokyo 106-0032, Japan

Established : March 2000

Business Activities : Advanced research in cognitive science, artificial intelligence, computational linguistics, and their application in the real world, as well as the development of software based on these fields.

App Store (Cognitive FortTalk) : <https://crl.fi/forttalk>

Official Website : <https://www.crl.co.jp/>



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Our company has been strengthened by **a history of groundbreaking initiatives** since its founding, along with leadership that possesses **deep insight** and **the ability to pioneer the future**. For more details, please see the sections on "Company History and Philosophy," "CEO's Career," and "Collection of CEO's Research Achievements."

■Company History and Philosophy

Cognitive Research Lab Co., Ltd. began its journey in 1988 as a **pioneering basic research** institute in Japan, at a time when terms like "**Cognitive Science**" and "**Cognitive Computing**" were not yet widely known to the public. Since its establishment, the company has been dedicated to **genuine basic research** and focused on developing platforms that significantly impact future society.

Our philosophy is to actively contribute to **shaping society 50 years from now** through the pursuit of knowledge and technological innovation, leading future innovations. To achieve this, we continuously **expand our research and development domains** and strive to **provide concrete solutions to societal challenges**.

Under this philosophy, Cognitive Research Lab collaborates with world-leading researchers in fields such as cognitive science, artificial intelligence, and computational linguistics to create innovative technologies. We also actively promote industry-academic partnerships, accelerating the application of research findings to real-world settings, aiming to improve the quality of people's lives and contribute to the realization of a sustainable society.



■CEO's Career

CEO **Hideto Tomabechi** embarked on his academic journey as a Fulbright scholar at **the Yale University Graduate School**, where he studied under Roger Schank, considered a pioneer in artificial intelligence. Afterward, he moved through Yale's Institute of Cognitive Science and the Artificial Intelligence Lab before advancing to **the highly esteemed School of Computer Science at Carnegie Mellon University**. There, he pursued a program in computational linguistics, becoming **the first Japanese** to earn a **Ph.D.** in the field.

Computational linguistics is an interdisciplinary field that merges artificial intelligence, linguistics, and computer science, providing the technical foundation for technologies like natural language processing and machine translation.

Since 2008, Hideto Tomabechi has been serving as a **Fellow** at Carnegie Mellon University's **CyLab**. He is also a visiting professor at **the C4I and Cyber Center of George Mason University**, where he engages in applied research on **military-grade next-generation cyber resilience** as part of the university's role in **cyber defense research**. Cyber resilience refers to a system's resistance and recovery capabilities against cyber attacks.

■Collection of CEO's Research Achievements

[MONA-LISA: Multimodal Ontological Neural Architecture for Linguistic Interactions and Scalable Adaptations](#)

This research paper was published in 1991, shortly after the founding of our company in 1988. The study explores a groundbreaking approach in **language recognition** called "MONA-LISA," utilizing one of the world's earliest developed generative AIs. This system achieves the integration of **symbolic thinking** and **subsymbolic processing**, efficiently handling audio and visual data within the same neural network framework.

Additionally, independent knowledge AIs operate in coordination not only at an abstract symbolic level but also at a lower subsymbolic level. This has led to the proposal of **the world's first solution**, still applicable today, to the "**hallucination**" problem in generative AI. Hallucination refers to the phenomenon where AI-generated data contains content that could not possibly exist in reality.

These research efforts have shed new light on the fields of **AI** and natural language processing, significantly advancing **the future of human-machine interaction**.

For more detailed information, please visit the Cognitive Research Lab's website.

[More Information: : Cognitive Research Lab's Research Achievements Collection](#)

