Goal3 Realization of AI robots that autonomously learn, adapt to their environment, evolve in intelligence and act alongside human beings, by 2050.

Here begins our new MIRAI
MOONSHOT
RESEARCH-D-DEVELOPMENT PROGRAM

Awareness AI Robot System for leading proactive behavior improvement

1. Position in the program

What will the advancement of robotics technology bring us? We have various visions of robots, such as robots that can perform dangerous or arduous tasks on our behalf, robots that are our best companions, always there to help us, and assistant robots that can take care of our daily needs. Among them, our project's role is to transform the future of living with robots into a more enjoyable and positive one. What do robots need to do for us to live happily and positively with them?

One keyword is 'awareness.' It is common for everyone to experience a loss of motivation when told to 'study!' We find it challenging to approach things with a positive mindset when they are imposed on us by others. However, we have come to understand that when we 'become aware' of the necessity and importance of studying on our own, we can actively and positively engage in it, leading to significant achievements. Not limited to studying, if we had robots that could make us aware of things like 'what abilities do I have?' and 'what should I engage in to succeed?', our lives could become more positive and vibrant compared to the present.

In this project, we are developing an AI that silently watches over us and provides appropriate support for awareness based on our capabilities. Together with the robots that will live with us from now on, we aim to realize a society where everyone can live positively.

2. Overview of the R&D and the Challenges

Is it possible for robots to facilitate the emergence of 'awareness'? Our project's primary objective is to advance AI technology capable of recognizing our latent potential and guiding us toward a proper understanding of it. To accomplish this, it is essential to gain a precise understanding of how awareness manifests in our brains and to determine the specific ways in which robots can assist in this process. To this end, we have outlined the following three research tasks:

1. Developing AI capable of estimating brain activity based on human behavioral data.
2. Creating a system that prompts tailored interventions through the AI developed in task 1.
3. Constructing a model of the unconscious mind to enhance awareness.

In Task 1., we will leverage quantifiable biometric data from everyday life to pioneer AI capable of gauging the brain activity associated with awareness and uncovering our latent potential. Awareness often arises from even subtle discomfort or moments of small pain. Our primary aim is to initially discern the brain activity patterns linked to such awareness through human behavior analysis. In this endeavor, we will illuminate the impact of robot interventions, particularly focusing on 'human-like actions' and 'awkwardness-free actions.

In Task 2., we will design a system aimed at fostering heightened awareness through the application of 'gentle stimuli.' Recent findings has shown that gentle stimuli, imperceptible to the human senses, are effective in enhancing awareness. Leveraging the AI developed in task 1, our initial focus will be on creating a system tailored to address chronic pain and motor paralysis. By introducing gentle stimuli, we aim to promote awareness, thereby potentially managing these conditions. Our long-term vision involves extending this system to tackle broader healthcare concerns and preventive measures for frailty.

In Task 3., we will delve into the intricacies of the unconscious. This exploration will be grounded in the correlation between biometric data, brain activity, and the interventions we uncover in tasks 1 and 2. We will seek a concrete understanding of how the unconscious functions, drawing upon insights from fields such as psychology and mathematical sciences, with the ultimate goal of applying this knowledge in society. Furthermore, we are committed to addressing concerns related to personal information throughout the biometric data collection process.

3. Future plans

What kind of presence should robots become in society in the future? It is undoubtedly the dream of many robot developers to create robots that can be our indispensable partners in life. Originally, robotics was a discipline that modeled the entire system including the robot's body, controller, behavioral goals, and environment, in order to generate appropriate actions. However, due to the difficulty of modeling the environment, robots that exhibit abilities surpassing humans in stable environments become completely powerless in real environments where various unexpected changes occur. As a whole Goal 3, we believe that we must overcome this problem and evolve robotics into a discipline that appropriately complements the missing parts within a system.