

## Development of New Techniques for Wireless EEG Measurement Device with Light Weight and Long Time Operation

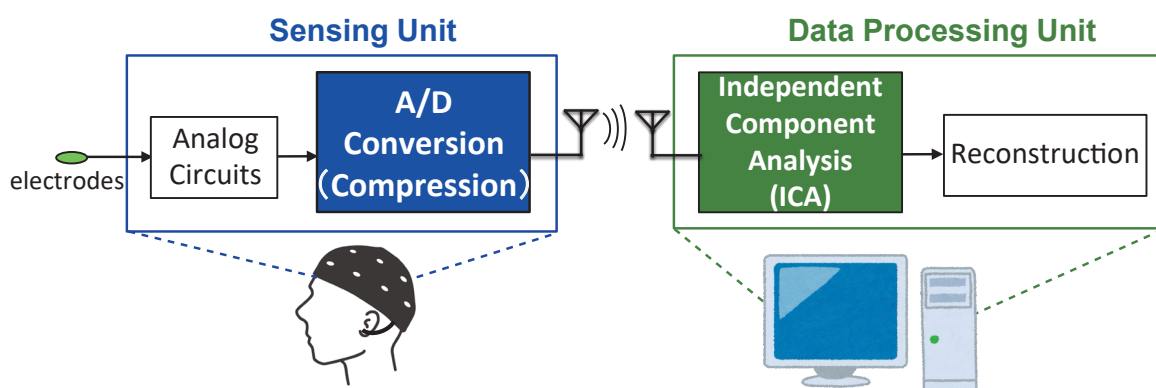
### Principal Investigator

Division of Electrical, Electronic and Infocommunications Engineering  
Graduate School of Engineering, Osaka University

Associate Professor Daisuke KANEMOTO

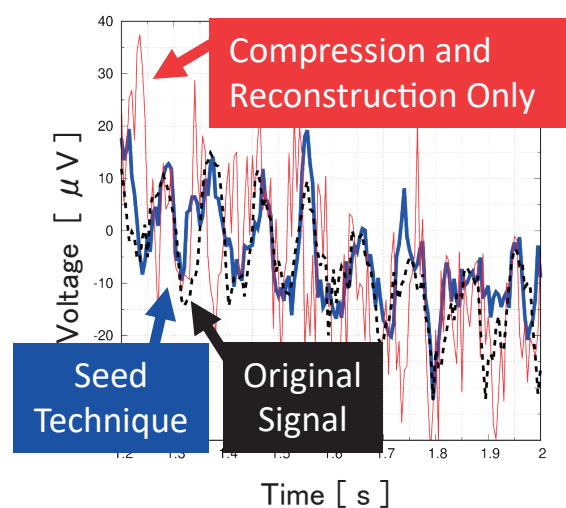
### Project Outline

Electroencephalography (EEG) can be used for the diagnosis of various brain diseases such as encephalitis, epileptic seizures, sleep disorders, and Alzheimer's disease. Therefore, a lot of research and development has been conducted on the usefulness of the wireless EEG devices. In this project, we are developing wireless EEG devices utilizing compressed sensing to realize a lightweight and can operate for a long time.



Compressed sensing allows sampling while compressing the signal, reducing the amount of information handled by the circuit, and thus enabling low power consumption of the circuit. This leads to a smaller battery size and longer operation time. However, general compressed sensing, has the problem of being vulnerable to disturbances, which reduces the accuracy of reconstruction.

For example, we have developed new techniques using ICA and K-SVD to improve the reconstruction accuracy and achieve even higher compression. The figure on the right is an example of our research results, which shows that the effect of disturbance can be suppressed, and the signal can be reconstructed with high accuracy.



Target Diseases : Various brain-related diseases

Marketability : The effectiveness of the proposed technology is expected to increase as the number of patients with brain diseases increases in Japan's aging society.