# Bedside Sleep Health Monitoring – Possibilities and Challenges

**Speaker:** **Ming Huang, Associate Professor, Nagoya City University, Japan**

**Date:** **2024/4/18**

**Time:** **13:00**

**Location:** **R205**

## Abstract:

Sleep disorders can undermine cognitive function, mood, and overall health, increasing the risk of chronic illnesses such as cardiovascular disease, obesity, and diabetes. Recognizing sleep's crucial role in health, the American Heart Association has included sleep health in its updated "Life Essential 8" framework, an evolution from the "Life's Simple 7." Traditional sleep assessments, often cumbersome and invasive, are not suitable for daily monitoring, which is essential for early detection of sleep disorders. To address these challenges, we introduce a novel, non-intrusive method for sleep monitoring using a 2-lead EEG signal analyzed by a customized Transformer model based on the sleep physiology. This method facilitates home use and, combined with AI techniques, aims to simplify the diagnostic process while enhancing accuracy. We propose this user-friendly system as a promising alternative technology for improving accessibility to sleep health monitoring for continuous, bedside use.

## Biography:

Dr. Ming Huang earned his Ph.D. from the University of Aizu in 2012 and currently serves as an Associate Professor at Nagoya City University and an Affiliate Associate Professor at the Nara Institute of Science and Technology. His research encompasses biomedical signal processing, digital health via big data analytics, machine learning, and chemo/bioinformatics within biomedical engineering. His work on noninvasive deep body thermometry and the development of monitoring technologies for cardiovascular and sleep health has notably contributed to the personal healthcare technology. Presently, his research is focused on assessing the impact of lifestyle factors on heart health utilizing cutting-edge sensing and deep learning techniques and exploring unconventional methods for treating sleep disorders. Additionally, he is invested in theoretically enhancing learning processes in the biomedical field, especially in addressing out-of-distribution scenarios, through the information bottleneck principle.