



# 應用科學研究中心

## Research Center for Applied Sciences



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## Machine learning approach for resistive-pulse analysis in pore sensors

**Date: 2017.03.09 (Thur)**

**Time: 14:50-15:50**

**Venue: B106 Auditorium, 1F, IRBST,  
Academia Sinica**

**跨領域科技研究大樓 1F B106 演講廳**

**Host: Chao-Cheng Kaun 關肇正老師**

## **Machine learning approach for resistive-pulse analysis in pore sensors**

Makusu Tsutsui

Simple and sensitive sensors for detecting virus and bacteria can greatly improve human health through enabling preemptive medicine. Solid-state micro- and nanopores are one of the potential device capable of identifying single-bioparticles from a transient change in the ionic current flowing through the conduit upon the particle translocation. Conventional concept of this resistive pulse analysis is to discriminate analytes by the difference in their size through comparing the height of ionic current spikes recorded. In my talk, in contrast, I will present our recent efforts to extricate finer features hidden in the ionic signatures that better discriminate each bioparticle exploiting a machine learning algorithm. Depending on the aspect-ratio structure, we found that pore sensors become sensitive to the particle shape and the surface charge density rather than the net volume whereby allowing discrimination of equi-sized bacteria and viruses.