

## 講演会のご案内

以下の通り講演会を開催します。聴講無料ですので、ぜひご参加ください。

なお、参加者数によっては会場を変更する可能性がありますため、参加予定の方は  
5月24日(金)までに市毛 (koichi@ynu.ac.jp) 宛に連絡をお願いします。

日時：2019年5月31日(金) 15:30～17:00

場所：横浜国立大学 理工学部講義棟 A-104 教室 (予定)

講師：Prof. Chun-Lin Liu (National Taiwan University, 国立台湾大学)

Title: Robustness of Difference Coarrays to Sensor Failures: Theory and New Array Configurations

Abstract:

In array signal processing, sparse arrays have received considerable attention since they can resolve  $\mathcal{O}(N^2)$  uncorrelated sources with  $N$  sensors, under mild assumptions. This attribute arises from the property that the difference coarray (the set of differences between sensor locations) has uniform linear array (ULA) segments of size  $\mathcal{O}(N^2)$ . However, for some sparse arrays, the difference coarray structure is susceptible to sensor failures, which could degrade the performance significantly. Empirically, ULAs whose difference coarrays only have  $\mathcal{O}(N)$  elements, are more robust than sparse arrays with  $\mathcal{O}(N^2)$  coarray sizes.

In this talk, a theory for quantifying such robustness will be presented. This theory is motivated by the coarray MUSIC algorithm, which estimates source directions based on difference coarrays. The theory is built on the  $k$ -essentialness property, which characterizes the patterns of  $k$  faulty sensors that shrink the difference coarray. Then the  $k$ -fragility is defined to quantify the robustness of difference coarrays to sensor failures. These notions not only provide new insights into the robustness of existing array configurations, but also make it possible to derive novel sparse arrays which own difference coarrays of size  $\mathcal{O}(N^2)$  and areas robust as ULAs. Numerical examples for these new results will also be demonstrated.

This is joint work with Prof. P. P. Vaidyanathan (California Institute of Technology).

Biography:

Chun-Lin Liu received the B.S. and M.S. degrees in electrical engineering and communication engineering from the National Taiwan University, Taipei, Taiwan, in 2010 and 2012, respectively. He received the Ph.D. degree in electrical engineering from the California Institute of Technology (Caltech), Pasadena, CA, USA, in 2018. He joined the Department of Electrical Engineering and the Graduate Institute of Communication Engineering, National Taiwan University, as an Assistant Professor in August 2018.

His research interests include sparse array signal processing, sparse array design, statistical signal processing, and digital signal processing. He received the Best Student Paper Award at the 41st IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2016, Shanghai, China, the 9th IEEE Sensor Array and Multichannel Signal Processing Workshop (SAM), 2016, Rio de Janeiro, Brazil, and ICASSP 2018, Calgary, Alberta, Canada. He also received the Student Paper Award at the 50th Asilomar Conference on Signals, Systems, and Computers, 2016, Pacific Grove, CA, USA. He was a recipient of the Ben P. C. Chou Doctoral Prize for outstanding doctoral dissertations in the broad area of information science and technology at Caltech in 2018.

問い合わせ先：市毛 弘一 (横浜国立大学), koichi@ynu.ac.jp