

國立中山大學應用數學系

學術演講

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講題：Random and Deterministic Approaches to a Collision Channel without Feedback

時間：2025/10/1 (Wednesday) 14:10 ~ 15:00

地點：理 SC 4009-0 教室

茶會：13:45

Abstract

As the ultra-reliability and low-latency are essential requirements for the applications of critical Internet of Things, in this talk we revisit collision channels without feedback. There are two main medium access control (MAC) approaches to a collision channel without feedback: random (slotted ALOHA-like) and deterministic (protocol sequence-based) schemes. Unlike the traditional slotted ALOHA, where each user follows a fixed transmission probability, protocol sequence-based scheme allow each user to deterministically decide when to transmit only according to its assigned sequence. In the first part of this talk, we will survey some results on protocol sequence-based schemes, including user-irrepressible (UI) sequences, conflict-avoiding codes (CACs) and multichannel CACs, which have some interesting combinatorial structures. In the second part, for a fair comparison, deadline-constrained slotted ALOHA schemes will be introduced to maximize the probability that a packet can be successfully received within a pre-assigned deadline. Some recent progress including the uniqueness of the optimal transmission probability that maximizes the successful delivery probability under multiple-packet reception (MPR) technology is addressed as well. Finally, we will consider the age-of-information (AoI), which represents the freshness of a packet, under both ALOHA-like and protocol sequence-based schemes.

敬 請 公 告 ！ 歡 迎 參 加 ！

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