



**THE CHINESE UNIVERSITY OF HONG KONG**  
Department of Information Engineering  
*Seminar*

**Massive Downlink: ARQ Protocols for Massive Wireless Access**

by

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**Date : 21 August 2023 (Monday)**  
**Time : 10:30am – 11:30am**  
**Venue : Rm 801, Ho Sin Hang Engineering Building, CUHK**

*Abstract*

The massive random access problem has received significant attention the past years due to its central role in providing connectivity to a very large number of users, e.g., in the Internet of Things. Meanwhile, the problem of providing downlink communication to a subset of a massive number of users has received much less attention. This talk will first provide an overview of some recent results in this area. We will then look into the specific problem of providing message acknowledgments to the set of decoded users in a massive random access scenario. We will define the information theoretic bounds and compare them to a number of practical schemes, including several naive schemes, which turn out to be suboptimal. Finally, we will see how the schemes can be used to implement ARQ for the massive access scenario.

*Biography*

Anders E. Kalør received the B.Sc. and M.Sc. degrees in computer engineering in 2015 and 2017, respectively, and the Ph.D. degree in wireless communications in 2022, all from Aalborg University, Denmark. He is currently a postdoctoral researcher at The University of Hong Kong, supported by an individual International Postdoc grant from the Independent Research Fund Denmark. Concurrently, he is affiliated with the Connectivity section at Aalborg University. In 2017, he was a visiting researcher at Bosch, Germany, and in 2020 at King's College London, UK. He was awarded the Spar Nord Foundation Research Award for his Ph.D. project (2023). His current research interests include communication theory and the intersection between wireless communications and machine learning for IoT.

**\*\* ALL ARE WELCOME \*\***