

## SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING  
COLLEGE OF DESIGN AND ENGINEERING  
Website: <https://cde.nus.edu.sg/ece>

**Area: Communications & Networks**

**Host: Assoc Prof. Mandar Chitre**

<b>TOPIC</b>	:	<b>A Time-Efficient And BER-Prediction-Based Link Tuning Strategy For Robust Mid-Range Underwater Communication</b>
<b>SPEAKER</b>	:	<b>Ms Wu Shuangshuang</b> Graduate Student, ECE Dept, NUS
<b>DATE</b>	:	<b>Thursday, 21 April 2022</b>
<b>TIME</b>	:	<b>10.00AM to 10.30AM</b>
<b>WEBINAR</b>	:	<b>Join Zoom Meeting</b> <a href="https://nus-sg.zoom.us/j/88683474826?pwd=UDZEWU1VMStQQ0QvdjNyZWNKR0RaUT09">https://nus-sg.zoom.us/j/88683474826?pwd=UDZEWU1VMStQQ0QvdjNyZWNKR0RaUT09</a>

### ABSTRACT

Underwater Acoustic Channel (UAC) for communication underwater is challenging due to its unique characteristics, such as low available bandwidth, long propagation delays, fast varying, etc. When the channel statistics change, a modulation scheme designed for a specific channel will underperform, motivating the need for Adaptive Modulation and Coding (AMC) techniques. An accurate prediction of the communication performance is critical in the design of AMC techniques. We utilize the channel physics information and propose a Bit Error Rate (BER) estimation model based on it. Predictions from such a model are then used in selecting modulation and coding schemes that maximize the communication throughput. At the same time, the BER estimation model is continually improved based on the channel feedback collected which constitutes the Channel State Information (CSI). We also propose feedback strategies to deal with the long propagation delays while gathering the channel feedback. These feedback strategies play an important role in improving the overall link throughput. Simulation results show that the proposed adaptive data-driven feedback strategy combined with the BER-prediction-based AMC technique guarantees robust and efficient communication.

### BIOGRAPHY

Ms. Wu is a Ph.D. candidate from Dept. of Electrical and Computer Engineering, NUS. Her research is mainly focused on adaptive modulation for underwater acoustic communication with machine learning techniques applied.

<https://cde.nus.edu.sg/ece/highlights/events/>