SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
Faculty of Engineering
Website: https://www.eng.nus.edu.sg/ece/

Area: Microwave & Radio Frequency

Host: Prof Guo Yong Xin

TOPIC	:	**Neural Network-Based Digital Pre-Distortion For Compensating Combined Impairments At Transmitters**
SPEAKER	:	**Mr Abdelwahab Fawzy Mohamed Soliman Afifi** **Graduate student, ECE Dept, NUS**
DATE	:	**Thursday, 9 July 2020**
TIME	:	**5.00PM to 5.30PM**
WEBINAR	:	**https://nus-sg.zoom.us/j/3597287152?pwd=eGY1MkJETE4xaGozSUNXK3JCWWszZz09** **Meeting ID: 359 728 7152** **Password: 864505**

ABSTRACT

A practical power amplifier (PA) has nonlinear characteristics that distort the output signal and hence increase the transmission error. Digital pre-distortion (DPD) has been widely accepted to compensate for the PA non-linearities. However, in direct-conversion transmitters (DCTs), DPD performance is affected by in-phase and quadrature (I/Q) imbalance. In this work, We utilize the Iterative Learning Control (ILC) algorithm to design a DPD scheme that compensates for PA nonlinearity under I/Q imbalance. At first, we prove that ILC is applicable in such a scenario. This proof is validated using simulations, as ILC is able to estimate the ideal input for the PA. The estimated ideal input is then exploited in training a neural network (NN)-based DPD model. After that, the number of real multiplications is calculated to evaluate the complexity of our proposal. Finally, we demonstrate the performance advantage of our proposed scheme in comparison with other existing polynomial based approaches through simulations and measurements.

BIOGRAPHY

Abdelwahab Fawzy received both Bachelor and Master Degree in Electronics and Electrical Communication Engineering from Menoufia University in Egypt. Now he is a PhD student at National University of Singapore (NUS), advised by Prof. Yong Xin Guo. His research interest includes Neural network for Digital Predistortion design.

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