



TEXAS A&M UNIVERSITY

Department of Electrical  
& Computer Engineering

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Bio-Group Seminar | Meeting ID: 514 754 727 | <https://tamu.zoom.us/j/514754727>

# Machine Learning Enabled Adaptive Wireless Power Transmission System for Neuroscience Study

## Abstract

We propose a novel machine learning (ML) approach for the adaptive control of wireless power transmission systems for neuroscience studies. In our proposed algorithm, we use deep convolutional network networks (CNN) to automatically track the movement and predict the posture of a lab animal, based on which the antenna system is dynamically switched to activate the antenna that maximizes the power efficiency. The proposed algorithm dramatically improves the volumetric and angular coverage in the cage as well as the efficiency of the overall power transmission system. We demonstrate the advantages of the proposed algorithm and the ML-enabled adaptive power transmission system via *in vitro* and *in vivo* experiments, which showcase the potential for their widespread use in various neuroscience studies.



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Hyun-Myung Woo is a Ph.D. student in Electrical and Computer Engineering at Texas A&M University. He received Bachelor of Science in Information & Communication Engineering and Master's of Computer Science from Yonsei University in South Korea. He was an embedded system software engineer in IDIS and a senior engineer standardizing 5G wireless communication in LG electronics. He is currently interested in computational approaches addressing diverse biological problems, such as study of protein-protein interaction networks and RNA structural alignments, and synchronization of a biological system.