



# ADAPTIVE BEAMFORMING USING MACHINE LEARNING

ALI DOĞUHAN KAVUKÇU, GOZEL MURRUKOVA  
DR. ÖZLEM ÖZGÜN

Electrical and Electronics Engineering  
Hacettepe University

## INTRODUCTION

- Adaptive beamforming technique steers the beam of antenna in desired direction, while cancelling signals from interfering angles.
- In this project, Adaptive techniques joined with Machine Learning in an attractive MATLAB app with cool Graphical User Interface.

## SOLUTION METHODOLOGY

Four different algorithms were implemented, to predict results for ULAs and Planar Arrays.

1. Least Mean Squares (adaptive)
2. AdaGrad (machine learning)
3. Deep Learning (LSTM and Regression)
4. Artificial neural networks (machine learning)

Training dataset was built using LMS to train models in Deep Learning and ANN to predict results for different user inputs.

