Prediction of Wideband Channel in Semi-Static Environment Using Linear Regression in Machine Learning

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Concepts and Relevance

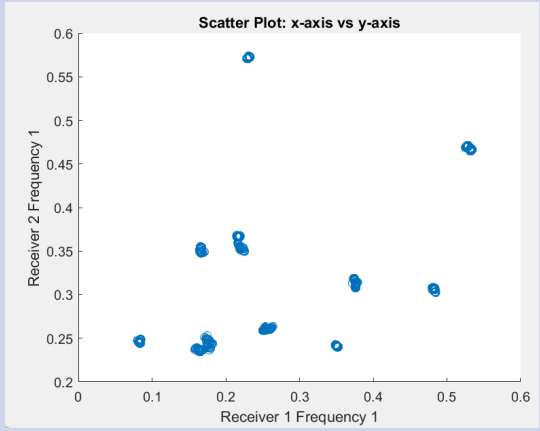
- **Wideband Orthogonal Frequency Division (OFDM) Multiplexing for Wireless Networks**
- **Estimate Wideband Channel of the Second receiver from the First using the Machine Learning Algorithm (based on linear regression)**
- **Consider in MATLAB**

1. **'fitlm: Fit Linear Regression'**
2. **'fitnlm: Fit nonLinear Regression'**

- **Minimization of Mean-Squared Error (MMSE) Between Predictive & Test**

The Attempt of This Work

- We divide the wideband single frequency into multiple narrowband frequency component;
- The predictive estimate of a second receiver is derived from the characteristics of frequency coefficients in the first receiver
- Scatter Plot b/w Rx1 & Rx2



The Attempt of This Work

- Frequency coefficients are generated from eleven different narrowband frequency components of a given receiver;
- Channel modeled $y = h_n \cdot x + w$
- |h|: Magnitude; w: AWGN;
- Predict Linear Regression Model between 'Trained' versus 'Actual'