

Topic: Space Time Codes, MIMO and Massive MIMO- Part I

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Relevant Semester : Nil

Relevant Course : Wireless Communication

Pre-Requisite : The knowledge of Digital Communication and Wireless Communication is preferable.

Course Description and Outline :

Space-Time Codes and MIMO

Part I – Introduction

- Diversity to combat erasures and fadings.
- The multiple antenna channel model.
- Coding gain and diversity in MIMO channels.

Part II - Information Theory

- Capacity when channel is unknown at transmitter.
- Outage probability for non-ergodic channels.

Part III - Coding

- Quick introduction to STBC.
- Code design criteria for block fading channels.
- Example of an LDPC code for MIMO channels.

Massive MIMO

Part 1

- Motivation and Case Studies
- Models and Fundamental Assumptions
- Favorable Propagation
- Single-Cell Operation

Part 2

- Uniform User Performance
- Impact of Hardware Impairments
- Energy Efficiency
- Myths around Massive MIMO