

Sheet1

DSP Principles and Applications in (Wireless) Communications

442.041 Advanced Signal Processing Seminar

Graz University of Technology, WS 2004/05, K. Witrisal and G. Kubin

We., 17:15-18:45

SR INW, Inffeldg. 12

| Nb. | Topic | Contents | Main References | Student | Date/Time |
|-----|--|---|---|----------------------|-----------|
| 1 | Fundamentals of Detection Theory I | Problem statement, mathematical formulation and techniques, decision theory | [Kay 2, Ch. 1-3], [Moon Stirling, Ch. 10, 11] | Klaus Kainrath | 17-11-04 |
| 2 | Fundamentals of Detection Theory II | Optimum detection of deterministic and random signals | [Kay 2, Ch. 4,5], [Moon Stirling, Ch. 10, 11] | Stefan Tertinek | 17-11-04 |
| 3 | Fundamentals of Estimation Theory I | Problem statement, mathematical formulation and techniques, MVU estimator, notion of the CRLB | [Kay 1, Ch. 1-3], [Moon Stirling, Ch. 10, 12] | Sarwar Ehsan | 24-11-04 |
| 4 | Fundamentals of Estimation Theory II | Linear Models, maximum likelihood and least squares estimation | [Kay 1, Ch. 4, 6, 7], [Moon Stirling, Ch. 10, 12] | Vedran Dizdarevic | 24-11-04 |
| -- | Inter-Symbol-Interference and Equalization | Channel Model, Linear Equalizers, Fractionally Spaced Equalizer, Decision Feedback Equalizer, Adaptive Equalization | [Proakis, Ch. 10,11], [Lee Messerschmitt, Ch. 8.3 ff] | available | 15-12-04 |
| 6 | Maximum Likelihood Sequence Detection | Data/channel model, Trellis Diagrams, Viterbi Algorithm, Error Probability calculation | [Proakis, Ch. 8.2, 10], [Lee Messerschmitt, Ch. 7, 8] | Klaus Dums | 15-12-04 |
| 7 | MU Detection I | Multiple Access Communications, CDMA (Spread Spectrum), CDMA Channels, Single User Matched Filter in the CDMA channel | [Verdu Ch. 1-3] | Thomas Blocher | 12-01-05 |
| 8 | MU Detection II | Notion of MU-Detection, Optimum MU Detection | [Verdu, Ch. 4] | Robin Hofe | 12-01-05 |
| 9 | MIMO Systems I | Introduction, ST Propagation, Channel and signal models | [Paulraj, Ch. 1-3] | Christian Puehringer | 19-1-05 |
| 10 | MIMO Systems II | Coding Gain and Diversity Gain | [Paulraj, Ch. 5] | Dmitriy Shutin | 19-1-05 |
| 11 | MIMO Systems III | Introduction to ST Coding | [Paulraj, Ch. 6] | Yohannes Alemseged | 26-1-05 |
| 12 | MU Detection III | Sub-optimum approaches to MU Detection | [Verdu Ch. 5-7] | Christoph Steiner | 26-1-05 |
| 13 | Signal Space Representation of Communication Signals | Signal Space Representation of Communication Signals, optimum detection, and error probability | [Proakis, Ch. 4, 5], [Lee Messerschmitt, Ch. 2, 8.1 f.] | Jac Romme | 02/02/05 |
| 14 | Introduction to Higher Order Spectral Analysis | | | Peter Singerl | 02/02/05 |