

INDEX

- A posteriori probabilities, 3, 7, 8, 41
- Binary Symmetric Channel (BSC), 3, 4, 22, 35, 63, 64-66
- Binary Symmetric Threshold Channel, 22
- Block length of code, 4
- Bose-Chaudhuri Codes, 7, 64
- Chernov bound, 25-27
 - derivation, 80-82
- Closed path of matrix, 92
- Coding theorem, Noisy Channel, 1, 2
- Computational cutoff rate, R_{comp} , 7, 52
- Computer simulations, 6, 63-73
- Computer time for simulation, 63
- Construction procedure for low-density matrices, 94-97
- Convergence of error probability with iterations, 48-51, 61, 62
- Convolutional codes, 7
- Decoder, 1
- Decoding, computation, 7, 8, 41, 45
 - maximum-likelihood, 23, 41
 - number of iterations, 45, 91
 - probabilistic scheme, 6, 42, 57
 - simple scheme, 6
- Discrepancy function, 24
- Distance function, 9
 - for Aⁿ-ary alphabet, 53, 55
 - for equiprobable ensemble, 10
 - for low-density ensemble, 13
- Distribution function of log-likelihood ratios, after decoding iteration, 52
 - for Gaussian channel, 67
 - for Rayleigh fading channel, 72
- Elias, P., 2, 4, 9, 35
- Encoder, 1
- Equipment complexity, 2, 41
- Equiprobable ensemble of codes, 9
- Error detection, 8
- Experimental results, 6, 63-73
- Expurgated ensemble, low-density codes, 18
- Expurgated random ensemble, 18, 34
- Fano, R. M., 7, 34
- Feedback and retransmission, 7, 8
- Gaussian noise channel, 22, 56, 63, 66-70
- Gilbert bound, 11
- Gorenstein, D., 7
- Log-likelihood ratios, 46, 66, 71
- Low density, ensemble of codes, 12
 - ensemble of matrices, 12
 - expurgated ensemble, 18
 - matrices, 12
 - maximum rate, 39
 - parity-check codes, 4
- Massey, J. L., 7
- Maximum-likelihood decoding, 23, 41, 56
- Minimum distance, 5, 9
 - related to correctable crossovers, 37
 - ratio, typical, 17
- Minimum-distance distribution function, Aⁿ-ary alphabet, 55
 - equiprobable ensemble, 11
 - low-density ensemble, 16, 76
- Modeling of channels, 2
- Moment-generating functions, 14, 25, 26, 54
- Noisy Channel Coding theorem, 1, 2,
 - for parity-check codes, 2
- Optimum code, 70
- Orthogonal equal energy signals, 56
- Parallel decoding computation, 46
- Parity-check codes, 3
 - Coding theorem, 2, 4
 - matrix, 4
- Parity-check set, 4
 - tree, 19, 42, 47
- Peterson, W. W., 7
- Pierce, J. R., 71
- Probability of decoding error P_e , 1, 17, 29
 - as affected by minimum distance, 34
 - equiprobable ensemble, 32
 - low-density ensemble, 38
- Probability of even number of events, 43
- Pseudorandom number generators, 63
- Rate of a code, 3
- Rayleigh fading channel, 22, 56, 63, 70-73
- Receivers, decision, 6, 67, 69, 73
 - likelihood, 6, 66, 67, 69, 73
- Reiffen, B., 2, 14
- Scrambling, 72
- Sequential decoding, 7, 52
- Serial decoding computation, 46
- Shannon, C. E., 1
- Signal energy (E, E_c), 67, 68
 - antipodal, 68
 - orthogonal, 68
- Source, information, 1
- Stirling approximation, 10
- Symmetric binary-input channel, 3, 21
- Symmetry, of $f(y)$, 23, 56
 - of transition probabilities, 21, 56
- Threshold decoding, 7
- Time diversity for Rayleigh fading channel, 72
- Uncertainty of received parity check, 40
- Wozencraft, J. M., 7
- Z transform, 59
- Zierler, N., 7