

# References for EECS 651

Books marked with \*\* will be placed on reserve in the Media Union

## Lossless Source Coding

Books:

- T. Bell, J. Cleary & I. Witten, *Text Compression*  
\*\* M. Nelson, *The Data Compression Book*  
J. Storer, *Data Compression Methods and Theory*  
J. Storer, *Image and Text Compression*  
I. Witten, A. Moffat, T. Bell, *Managing Gigabytes*

Book Chapters:

- N. Abramson, *Information Theory and Coding*, Chapters 3,4  
R. Ash, *Information Theory*, Chapter 2  
R. Blahut, *Principles and Practice of Information Theory*, Chapter 3.  
V. Capellini, *Data Compression and Error Control Techniques with Applications*, Chapters 2, 7.  
T. Cover & J. Thomas, *Elements of information theory*, Chapter 5  
R. Gallager, *Information Theory and Reliable Communication*, Chapter 3.  
A. Gersho & R. Gray, *Vector Quantization and Signal Compression*, Chapter 9  
R. Hamming, *Coding and Information Theory*, two editions, Chapters 4,5,6  
\*\* J. Gibson, T. Berger, T. Lookabough, D. Lindbergh, R. Baker, *Digital Compression for Multimedia*, Chapters 2,3  
D. Hankerson, G. Harris and P. Johnson, Jr., *Introduction to Information Theory and Data Compression*, Chapter 5-9.  
\*\* N. Jayant and P. Noll, *Digital coding of waveforms: Principles and Applications to Speech and Video*, Chapter 10 on Run-Length Coding.  
T. Lynch, *Data Compression: Techniques and Applications*, Chapter 3  
D. Jones, *Elementary Information Theory*, Chapter 3.  
M. Mansuripur, *Introduction to Information Theory*, Chapters 2,3,4  
R. McEliece, *The Theory of Information and Coding*, Chapter 10  
A. Netravali & B. Haskell, *Digital Pictures: Representation and Compression*, Chapter 3  
J. Proakis & M. Salehi, *Communication Systems Engineering*, Chapter 4.  
S. Shanmugam, *Digital and Analog Communications Systems*, Chapter 4.  
J. Stiffler, *Theory of Synchronous Communications*, Chapter 10, 11, 12  
I. Witten, A. Moffat, T. Bell, *Managing Gigabytes: Compressing and Indexing Documents and Images*, Chapters 2,6,7,9.

Papers

- L. Davisson and R. Gray, *Data Compression*, book of reprinted papers, vol. 14 in the series *Benchmark, Papers in EE and CS*.  
D. Leweler and D. Hirschberg, "Data Compression," *ACM Computing Surveys*, pp. 261-296, Sept. 1987.  
W. Pennebaker, W. Mitchell et al., Arithmetic Coding Articles, *IBM Journal Research and Development*, Nov. 1988.  
T. Welch, "A technique for high-performance data compression," *Computer*, pp. 8-19, June 1984. (About Ziv-Lempel codes.)  
I. Witten, R. Radford and J. Cleary, "Arithmetic coding for data compression," *Comm. ACM*, Vol. 30, pp. 520-540, June 1987.

## Lossy Source Coding

### Books

- \*\* A. Gersho & R. Gray, *Vector Quantization and Signal Compression*.
- \*\* N. Jayant and P. Noll, *Digital coding of waveforms: Principles and Applications to Speech and Video*
- \*\* K. Sayood, *Introduction to Data Compression*.

### Book Chapters

- J-P. Adoul, "Speech coding algorithms and vector quantization", Chapter 3 of *Advanced Digital Communications: Systems and Signal Processing Techniques*, by K. Feher.
- J.H. Conway & N.J.A. Sloane, *Sphere Packings, Lattices and Groups*, Chapter 2 on lattices quantizers
- J. Gibson, *Principles of Digital and Analog Communications*, Chapter 13
- J. Gibson & K. Sayood, "Lattice Quantization", a chapter in *Advances in Electronics and Electron Physics*, vol. 72.
- \*\* J. Gibson, T. Berger, T. Lookabough, D. Lindbergh, R. Baker, *Digital Compression for Multimedia*, Chapters 4-11.
- A. Jain, *Fundamentals of Digital Image Processing*, Chapters 4,11
- A. Netravali & B. Haskell, *Digital Pictures: Representation and Compression*, Chapters 5,6
- J. Proakis, *Digital Communications*, Section 2.3.2
- J. Proakis & M. Salehi, *Communication Systems Engineering*, Chapter 4.
- B. Sklar, *Digital communications: fundamentals and applications*, Chap. 11 by F. Harris.
- P. Swaszek, "Vector quantization," Chap 15 in *Communications and Networks*, ed. by I. Blake and V. Poor.
- J. Storer, *Image and Text Compression*, Parts 2 and 3.

### Papers

- H. Abut, *Vector Quantization*, book of reprinted papers, IEEE.
- L. Davisson and R. Gray, *Data Compression*, book of reprinted papers, vol. 14 in the series *Benchmark, Papers in EE and CS*.
- A. Gersho and V. Cuperman, "Vector quantization: a pattern-matching technique for speech coding," in *IEEE Commun. Magazine*
- A. Gersho, "Asymptotically optimal block quantization," *IEEE Trans. Inform. Thy.*, July 1079.
- R. Gray, "Vector quantization," in *IEEE ASSP Magazine*, April 1984.
- R. Gray and D.L. Neuhoff, "Quantization," *IEEE Trans. Inform. Theory*, Oct. 1998. This paper has a summary of high-resolution theory.
- A. Jain, "Image data compression: a review", *IEEE Proceedings*, March 1981.
- N. Jayant, *Waveform quantization and coding*, book of reprinted papers, IEEE.
- Y. Linde & R. Gray, "An algorithm for vector quantizer design," *IEEE Trans. Inform. Thy.*, Jan. 1980.
- J. Makhoul, S. Roucos and H. Gish, "Vector quantization in speech coding," *IEEE Proceedings*, Nov. 1985.
- N. Nasrabadi and R. King, "Image coding using vector quantization: a review," *IEEE Trans. Comm.*, Aug. 88.
- P. Swaszek, *Quantization*, book of reprinted papers, vol. 29 in the series *Benchmark, Papers in EE and CS*.

## Rate-distortion theory

### Books

- R. Gray, *Source Coding Theory*  
T. Berger, *Rate Distortion Theory: A Mathematical Basis for Data Compression*  
T. Berger and L. Davisson, *Advances in Source Coding*.  
C. Shannon, "The Mathematical Theory of Communication," *Bell System Tech. J.*, July and Oct. 1948, also reprinted in a book by Shannon and Weaver.

### Book Chapters

- R. Blahut, *Principles and Practice of Information Theory*, Chapter 6.  
T. Cover & J. Thomas, *Elements of information theory*, Chapter 13  
R. Gallager, *Information Theory and Reliable Communication*, Chapter 9.  
J. Gibson, *Analog and Digital Communications*, Chapter 12  
N. Jayant and P. Noll, *Digital Coding of Waveforms: Principles and Applications to Speech and Video*. Appendix D.  
J. Proakis & M. Salehi, *Communication Systems Engineering*, Chapter 4.  
D. Sakrison, *Notes on Analog Communication*, Chapter 6  
H. Stark, F. Tuteur, J. Anderson, *Modern Electrical Communications*, Section 11.4  
A. Viterbi and J. Omura, *Principles of Digital Communication and Coding*, Chapters 7,8

### Papers

- L. Davisson and R. Gray, *Data Compression*, book of reprinted papers, vol. 14 in the series *Benchmark, Papers in EE and CS*.  
J. Kieffer, "A survey of the theory of source coding with a fidelity criterion," *IEEE Trans. Inform. Thy.*, Sept. 1993

## Speech and Audio Coding

### Books

- B. Atal, V. Cuperman and Gersho, *Advances in Speech Coding*  
B. Atal, V. Cuperman and Gersho, *Speech and Audio Coding for Wireless and Network Applications*  
T. Barnwell, K. Nayebi, C. Richardson, *Speech Coding: A Computing Laboratory Textbook*.  
A. Kondo, *Digital Speech Coding for Low Bit Rate Communication Systems*  
B. Kleijn and K. Paliwal, Editors, *Speech Coding and Synthesis*  
J. Markel and A. Gray, Jr., *Linear Prediction of Speech*  
P. Papamichalis, *Practical Approaches to Speech Coding*  
S. Quackenbush, T. Barnwell, M. Clements, *Objective Measures of Speech Quality*

### Book Chapters

- Bellamy, *Digital Telephony*,  
J. Deller, J. Proakis and J. Hansen, *Discrete-Time Processing of Speech Signals*, Chapter 7  
J. Flanagan, *Speech Analysis, Synthesis and Perception*, Chapter 8.  
J. Gibson, T. Berger, T. Lookabough, D. Lindbergh, R. Baker, *Digital Compression for Multimedia*  
N. Jayant and P. Noll, *Digital coding of waveforms: Principles and Applications to Speech and Video*  
B. Keiser and E. Strange, *Digital Telephony and Network Integration*, Chapters 2,3,4  
D. O'Shaughnessy, *Speech Communication: Human and Machine*, Chapters 7,8.  
T. Parsons, *Voice and speech procesing*, Chapters 9 and 10.  
L. Rabiner and R. Schafer, *Digital Processing of Speech Signals*.

## Papers

- J-P. Adoul, "Speech coding algorithms and vector quantization", Chapter 3 of *Advanced Digital Communications: Systems and Signal Processing Techniques*, by K Feher.
- A. Gersho and V. Cuperman, "Vector quantization: a pattern-matching technique for speech coding," in *IEEE Commun. Magazine*
- J. Flanagan, M. Schroeder, B. Atal, R. Crochiere, N. Jayant, and J. Tribolet, "Speech coding," *IEEE Trans. Commun.*, April 1979, includes a playable record.
- N. Jayant, "Digital coding of speech waveforms: PCM, DPCM and DM quantizers," *IEEE Proceedings*, May 1974, includes a playable record.
- J. Makhoul, S. Roucos and H. Gish, "Vector quantization in speech coding," *IEEE Proceedings*, Nov. 1985.
- N. Gilchrist and Christer Grewin, *Collected Papers on Digital Audio Bit-Rate Reduction*.

## Image and Video Coding

### Books

- M. Barnsley, *Fractal Image Compression*
- V. Bhaskaran and K. Konstantinides, *Image and Video Compression Standards*.
- R. Clarke, *Digital Compression of Still Images and Video*
- R. Clarke, *Transform Coding of Images*
- B. Furht, J. Greenberg, R. Westwater, *Motion Estimation Algorithms for Video Compression*
- \*\* J. Gibson, T. Berger, T. Lookabaugh, D. Lindbergh, and R. L. Baker, *Digital Compression for Multimedia*, 1998.
- B. Haskell, A. Puri, A. Netravali, *Digital Video: An Introduction to MPEG-2*
- W. Kou, *Digital Image Compression: Algorithms and Standards*
- J-P Leduc, *Digital Moving Pictures: coding and Transmission on ATM Networks*
- A. Netravali and B. Haskell, *Digital Pictures: Representation and Compression*
- J. Ozer, *Video Compression for Multimedia*
- W. Pennebaker and J. Mitchell, *JPEG Still Image Compression Standard*
- M. Rabbani and P. Jones, *Digital Image Compression Techniques*
- T. Ramstad, *Subband Compression of Images: Principles and Examples*
- K. Rao and P. Yip, *Discrete Cosine Transform, Algorithms, Advantages, Applications*
- K. Rao and J.J. Hwang, *Techniques and Standards for Image, Video, and Audio Coding*
- G. Schuster and A. Katsaggelos, *Rate-Distortion Based Video Compression*
- J. Storer, *Image and Text Compression Motion Analysis for Image Sequence Coding*
- \*\* D. S. Taubman, and M. W. Marcellin, *JPEG2000: image compression fundamentals, standards, and practice*
- L. Torres and M. Kunt, *Video Coding: The Second Generation Approach*.
- R. Westwater and B. Furht, *Real-Time Video Compression: Techniques and Algorithms*

### Book Chapters

- D. Hankerson, G. Harris and P. Johnson, Jr., *Introduction to Information Theory and Data Compression*, Chapter 10.
- F. Huck and C. Fales, *Visual Communication: An Information Theory Approach*, Chapters 5 and Appendix D.
- A. Jain, *Fundamentals of Digital Image Processing*, Chapters 4,5,6,11
- B. Keiser, *Broadband Coding, Modulation, and Transmission Engineering*, Chapter 3 on video encoding.
- W. Pratt, *Digital Image Processing*, Part 6.
- A. Rosenfeld and A. Kak, *Digital Image Processing*

- J. Storer, *Image and Text Compression*, Part 1.  
I. Witten, A. Moffat, T. Bell, *Managing Gigabytes: Compressing and Indexing Documents and Images*, Chapters 6,7,9.

#### Papers

- A. Jain, "Image data compression: a review", *IEEE Proceedings*, March 1981.  
D. Le Gall, "MPEG: A Video Compression Standard for Multimedia Applications, *Communications of the ACM*, April, 1991. N. Nasrabadi and R. King, "Image coding using vector quantization: a review," *IEEE Trans. Comm.*, Aug. 88.  
W. Pratt, *Image Transmission Techniques*, collection of papers.  
G. Wallace, "The JPEG Still Picture Compression Standard", *Communications of the ACM*, April, 1991.

#### **501 level textbooks on probability and random processes**

- D. Childers, *Probability and Random Processes*  
W. Davenport, *Probability and Random Processes*  
W. Davenport and W. Root, *Introduction to the Theory of Random Signals*  
W. Gardner, *Introduction to Random Processes*, (two editions)  
R. Gray and L. Davisson, *Random Processes*  
R. Gray and L. D. Davisson, *An Introduction to Statistical Signal Processing* is available for free download at: [www-ee.stanford.edu/~gray/sp.html](http://www-ee.stanford.edu/~gray/sp.html)  
G. Grimmett and D. Stirzaker, *Probability and Random Processes*  
A. Leon-Garcia, *Probability and Random Processes for Electrical Engineering*  
R. Mortensen, *Random Signals and Systems*  
A. Papoulis, *Probability Random Variables and Stochastic Processes*, two editions.  
B. Picinbono, *Random Signals and Systems*  
S. Ross, *Introduction to Probability Models*  
D. Sakrison, *Communication Theory* (Chapters 3 and 4)  
H. Stark and J. Woods, *Probability, Random Processes and Estimation Theory for Engineering*