Appendix

A CD-ROM has been included in this book to provide readers with supplementary reading material, computer programs, and selected digital audio and image data. The MATLAB programs used to demonstrate several examples have been included so that readers can run the programs themselves to process multimedia signals. The MATLAB code has been chosen since it is versatile tool for signal processing, and graphical plots. Two HTML codes (corresponding to Chapter 13) have also been included in the CD. In addition, two theses written by the author have been included for those interested to learn more about visual compression and retrieval, especially in the wavelet transform framework. The materials included in the CD are listed below:

A.1 MATLAB Functions

These are functions called by main MATLAB programs.

```
CD:\MATLAB\dwtorthogonal       % Functions for orthog. DWT calculation
CD:\MATLAB\dwtbiorthogonal     % Functions for biorth. DWT calculation
CD:\MATLAB\motion estimation   % Functions for motion estimation
CD:\MATLAB\misc                % Miscellaneous MATLAB Functions
```

A.2 MATLAB Examples (CD:\programs)

These are the original MATLAB programs used in various examples.

```
Example2_1.m      % audio noise masking
Example2_2.m      % MIDI file
%
Example4_6.m      % SNR of quantized audio signal
%
Example5_2.m      % DFT of 1-D signal
Example5_4.m      % DCT of 1-D signal
Example5_10.m     % 2-D DFT Spectrum
%
Example7_3.m      % Companding of audio signal
Example7_4.m      % Calculation of the LPC coefficients
```

```
Example7_6.m      % DPCM coding of audio signal
%
Example8_2.m      % DPCM coding of image
Example8_3.m      % DPCM coding of image
Example8_6.m      % Energy compaction using DCT and wavelet
Example8_7.m      % Performance of block-DCT coding
%
Example9_3.m      % Full search motion vector calculation
Example9_4.m      % Fast motion vector calculation
Example9_5.m      % Motion vector calculation for Claire sequence
%
Example10_1.m     % Audio filtering
Example10_2.m     % Audio equalization
Example10_3.m     % Noise suppression by digital filtering
Example10_4.m     % Spectral subtraction method
Example10_5.m     % MIDI file
Example10_6.m     % MIDI file
%
Example11_1.m     % Image interpolation
Example11_2.m     % Image cropping
Example11_3.m     % Image contrast stretching
Example11_4.m     % Histogram Equalization
Example11_5.m     % Image Sharpening
Example11_6.m     % Wipe operation
Example11_7.m     % Dissolve operation
Example11_8.m     % Fade in and out operations
%
Example12_1.m     % Energy compaction in the YIQ/YUV color space
```

A.3 Hypertext Examples (CD:\programs)

These are the HTML/XML programs used in Chapter 13.

```
Example13_1.htm     % HTML code
Example13_2.htm     % XML code embedded in HTML
```

A.4 Supplementary Chapters (CD:\supplementary chapters)

Some color figures were originally intended to be included in the book. However, they were ultimately not included in order to reduce printing costs. These figures (Chapter 3 and 8) have been included in the CD.

A.5 Theses (CD:\documents)

The following theses were written by the author, and included for interested readers who want to learn more about visual compression and retrieval, especially in the wavelet transform framework.

1. M. K. Mandal, *Wavelets for Image Compression*, M.A.Sc Thesis, University of Ottawa, 1995.
2. M. K. Mandal, *Wavelet Based Coding and Indexing of Images and Video*, Ph.D. Thesis, University of Ottawa, Fall 1998.

A.6 Input Data Files

Audio (CD:\data\audio)

bell.wav % An 8-bit, 22.05 KHz audio signal
test44k.wav % An 8-bit, 44.1 KHz audio signal
noisy_audio1.wav % Audio signal with narrowband noise
noisy_audio2.wav % Audio signal with wideband noise

Images (CD:\data\images)

{airplane, baboon, Lena}.tif % standard 512x512 gray level images
{banff1, banff2, lakelouise,niagra, geeta}.tif % Miscellaneous images
lenablur.tif % blurred Lena image
airplane256.tif % 256x256 airplane image

Video (CD:\data\video)

{claire1,claire2}.tif % two frames from Claire sequence
{football000,football002}.tif % two frames from football sequence
{shot1,shot3}.tif % frames from two video shots

A.7 Output Data Files (CD:\data\)

Chapter 2

test{1,2,3,4,5}.wav % Output of Example 2.1
Examp2_2.mid % Output of Example 2.2

Chapter 10

bell1_lpf.wav % LPF output of Example 10.1
bell1_hpf.wav % HPF output of Example 10.1
bell1_bpf.wav % BPF output of Example 10.1
Examp10_2.wav % Output of Example 10.2

Examp10_3_128tap.wav % Output of Example 10.3 for 128 tap filter
Examp10_3_200tap.wav % Output of Example 10.3 for 200 tap filter
Examp10_4.wav % Output of Example 10.4
Examp10_5.mid % Output MIDI file for Example 10.5
Examp10_6.mid % Output MIDI file for Example 10.6

Video

CD:\data\chap11\wipe1 % Transition frames in Example 11.6
CD:\data\chap11\wipe2 % Transition frames in Example 11.6
CD:\data\chap11\dissolve % Transition frames in Example 11.7
CD:\data\chap11\fade % Transition frames in Example 11.8