

Guide to DVD Chapter 18 Examples: *Brian Carty*

Binaural Audio Processing: A Sample Application

Both of the programs discussed use libsndfile and FFTW3. libsndfile can be downloaded from www.mega-nerd.com/libsndfile. FFTW3 can be downloaded from <http://www.FFTW.org/>. Install the packages for your system. The default install locations for the relevant headers and libraries are /usr/local/include and /usr/local/lib respectively. Assuming files are in default locations, the following command will build the data preparation program:

```
g++ datapreparation.cpp -o dataprep -I/usr/local/include
-L/usr/local/lib -lsndfile -lfftw3
```

Run the program from the current directory using the output name:

```
./dataprep
```

The program expects the time domain dataset to be in a folder called 'diffuse' in the working directory. All HRIR files should be in this folder. No subfolders should be used. The 'diffuse' folder, containing the HRIRs is included.

The data files are created in the working directory, and can now be used with the main program (it expects them to be in the working directory). Compile it as above, remembering to include the functions file.

```
g++ binauralmover.cpp binauralmoverfunctions.cpp -o mover
-I/usr/local/include -L/usr/local/lib -lsndfile -lfftw3
```

Run the program from the current directory using the output name:

```
./mover
```

The program will prompt for the number of buffers for each crossfade, the input file name and the trajectory text file. There are 2 mono audio files included. Try, for example, the files with the trajectory in move.txt (from 0 degree elevation, 0 degree angle: in front, to 0 degree elevation 90 degree angle: to the right) using 8 crossfade buffers for sample.wav and 1 for noise.wav, as sample.wav is more narrowband. A file named 'mover.wav' will be written to the current directory. Listen to it in headphones, bearing in mind the restrictions mentioned in the main text. Try the program with other sources and trajectories, remembering the datafiles have a sampling rate of 44,100 Hz (the input file should agree).