

HMM Training Work Flow

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I. Step 1: Providing input files

A. Sensor data files

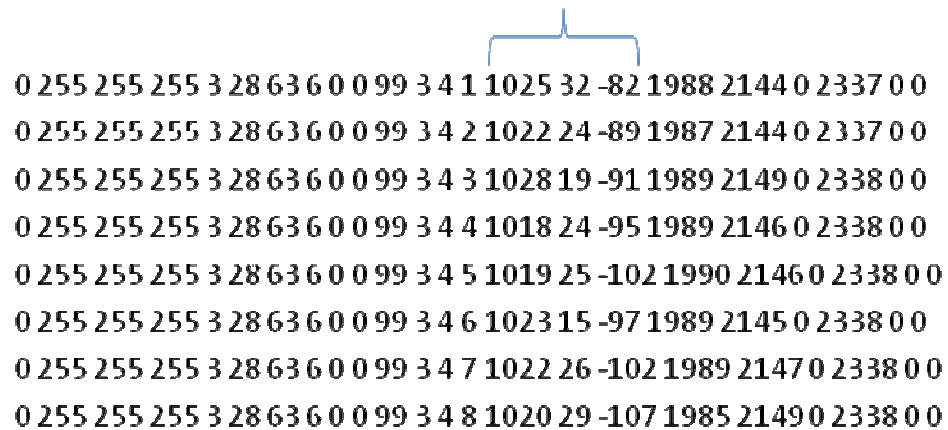
Sensor data files are placed in the “split” directory, and have the following format.

Example file name: m0001_s01_m01_n03.txt

1. m0001 refers to experiment number.
2. s01 refers to subject number.
3. m01 refers to movement number.
4. n03 refers to mote number.

As illustrated in figure 1, our system uses columns 15:18, which refer to accelerometer data in our case. The required file format can be changed in the “divide_samples” script.

Figure 1: Example sensor data file.



```
0 255 255 255 3 28 63 6 0 0 99 3 4 1 1025 32 -82 1988 2144 0 2337 0 0
0 255 255 255 3 28 63 6 0 0 99 3 4 2 1022 24 -89 1987 2144 0 2337 0 0
0 255 255 255 3 28 63 6 0 0 99 3 4 3 1028 19 -91 1989 2149 0 2338 0 0
0 255 255 255 3 28 63 6 0 0 99 3 4 4 1018 24 -95 1989 2146 0 2338 0 0
0 255 255 255 3 28 63 6 0 0 99 3 4 5 1019 25 -102 1990 2146 0 2338 0 0
0 255 255 255 3 28 63 6 0 0 99 3 4 6 1023 15 -97 1989 2145 0 2338 0 0
0 255 255 255 3 28 63 6 0 0 99 3 4 7 1022 26 -102 1989 2147 0 2338 0 0
0 255 255 255 3 28 63 6 0 0 99 3 4 8 1020 29 -107 1985 2149 0 2338 0 0
```

B. Manual Annotations

If the sensor data files are accompanied by manual annotations, then they are stored in the “annotations/default” directory.

Example file name: m0001_s01_m02.txt

The annotations are stored in a csv file, where the left column refers to time sample, and the right column refers to event label.

Figure 2: Example manual annotations file.

```
112,1
119,2
128,3
136,4
143,1
150,2
159,3
165,4
172,1
180,2
188,3
197,4
203,1
```

II. Step 2: Running HMM Generation GUI

Figure 3 shows how sensor data files are specified based on experiment, subject, movement, and mote numbers.

If the “Pressure Sensor Annotations” box is not checked, the system uses the annotation files in the “annotations/default” directory. Otherwise it will use the sensor data files in the “split” directory to automatically generate annotations. Which sensor data files it uses is specified by “Pressure Sensor Motes.” As illustrated in figure 4, the pressure sensor file uses column 20 to generate annotations. This can be modified in the “create_an” script.

Figure 3: Sensor data to be used for training.

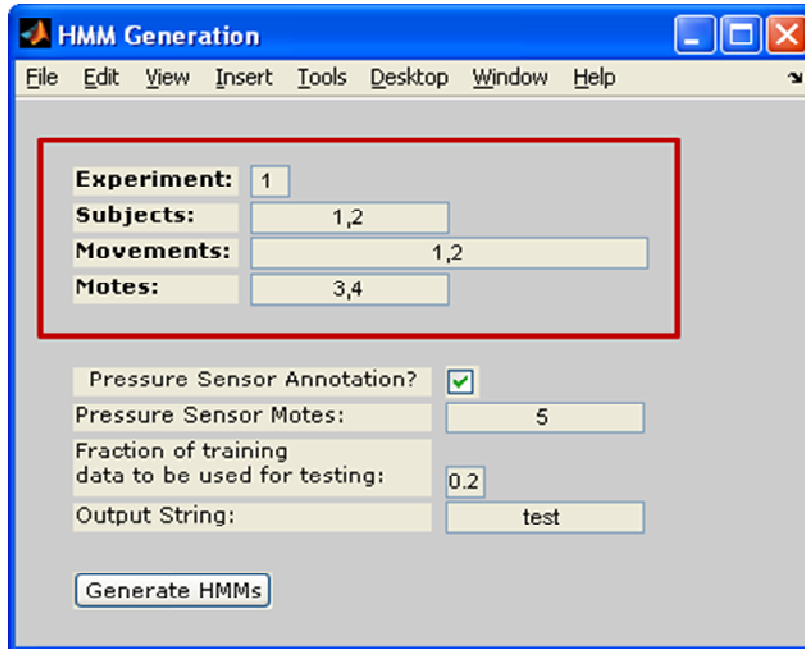


Figure 4: Example pressure sensor file.

```
0 255 255 255 18 28 63 6 0 0 99 18 2 1 0 0 0 480 1464 1607 1929 0 0  
0 255 255 255 18 28 63 6 0 0 99 18 2 2 0 0 0 472 1419 1606 1883 0 0  
0 255 255 255 18 28 63 6 0 0 99 18 2 3 0 0 0 469 1456 1610 1936 0 0  
0 255 255 255 18 28 63 6 0 0 99 18 2 4 0 0 0 461 1395 1610 1888 0 0  
0 255 255 255 18 28 63 6 0 0 99 18 2 5 0 0 0 473 1464 1612 1938 0 0  
0 255 255 255 18 28 63 6 0 0 99 18 2 6 0 0 0 458 1390 1612 1891 0 0  
0 255 255 255 18 28 63 6 0 0 99 18 2 7 0 0 0 468 1448 1610 1938 0 0
```

III. Step 3: Output file

After running "generate_hmm" a ".h" file will appear in the base directory, and can be used to implement the Viterbi algorithm on spine nodes.