

## APPENDIX F

### mel.m

```

%
% FUNCTION mel
%
% INPUTS:
% =====
%
% p is the number of filters in the filter bank
% n is the length of the FFT
% fs is the signal sampling rate (Hz)
%
% OUTPUTS:
% =====
%
% x is a matrix containing the filterbank amplitudes
%

function m = mel(p, n, fs)

f0 = 700 / fs;
fun = floor(n/2);

r = log(1 + 0.5/f0) / (p+1);

b1 = n*(f0 * (exp([0 1 p p+1] * r) - 1));

b1 = floor(b1(1)) + 1;
b2 = ceil(b1(2));
b3 = floor(b1(3));
b4 = min(fun, ceil(b1(4))) - 1;

pf = log(1 + (b1:b4)/n/f0) / r;
fp=floor(pf);
pm = pf - fp;

r = [fp(b2:b4) 1+fp(1:b3)];
c = [b2:b4 1:b3] + 1;
v = 2 * [1-pm(b2:b4) pm(1:b3)];

m = sparse(r, c, v, p, 1+fun);

%
% END OF FUNCTION mel
%
```