

Errata and warnings for the TFTB Tutorial and Demos

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This is a list of the problems I encountered while reading the tutorial and "playing" with the toolbox, together with a couple of suggestions.

Chapter 1

1. In doing what the Example 1 suggests (p. 13), I got the following error:

```
>> load bat
>> t0=linspace(0,2500/2304,2500);
>> plot(t0,bat); xlabel('Time [ms]');
?? Error using ==> plot
Vectors must be the same lengths.
In fact, the number of data in bat is 2048, so only by putting
>> t0=linspace(0,2048/2304,2048);
I could plot the signal, which by the way, besides being shorter, is slightly different from the one plotted in Fig. 1.7 of the tutorial.
```
2. For the same reason as before, it is impossible to plot the energy spectrum of the `bat` signal without replacing

```
>> f0=(-1250:1249)*230.4/2500;
```

by

```
>> f0=(-1024:1023)*230.4/2048;
```
3. I could not upload the matrix `tfr` of the pseudo WV distribution of the bat signal (p.14), neither `t` nor `f`, because they haven't apparently been saved in `bat.mat`.

Chapter 2

Following the instructions of the example at p. 30, I get a group-delay plot rather different from the one in Fig. 2.10 (lower panel), the signal being the same.

Chapter 3

1. Starting from p. 40, the syntax for generating windows should be corrected in the whole document and in the *Reference Guide*. In this particular case:

```
>> h=window(65,'hamming')
```

should be replaced by

```
>> h=tftb_window(65,'hamming')
```

or

```
>> h=window(@hamming,65)
```
2. In the example at p. 45, for plotting the squared modulus of the Gabor representation,

```
>> t=1:256; f=linspace(0,0.5,128); imagesc(t,f,tfr(1:128,:));
```

should be replaced by

```
>> t=1:16; f=linspace(0,0.5,8); imagesc(t,f,tfr(1:8,:));
```

since `size(tfr) ----> 16 16`.
3. The ordinate limits in the plot relative to the same example are $[-0.03571, 0.53571]$, instead of being $[0, 0.5]$ as in Fig. 3.11.
4. Analogously, at p. 46,

```
>> imagesc(t,f,tfr(1:128,:));
```

should be replaced by

```
>> imagesc(t,f,tfr(1:16,:));
```

and the limits problem of the previous point arises again.

Chapter 4

1. At the end of example 2 (p. 60), "We will see earlier..." should be replaced by "We will see later on...".
2. Concerning the sequence of the example at p. 63, it is impossible to load the file `movwv2at.mat` because it does not exist. At line 75 of the corresponding demo file (`tfdemo4.m`), I found the command
`M=movwv2at(128,15);movie(M,10);clear M;`
but this gives a different plot from the one in Fig. 4.3.
3. Same problem as before at p. 71. The corresponding line in the demo file is:
`M=movsp2wv(128,5);movie(M,10);clear M;`
and this gives the same sequence as in Fig. 4.11.
4. The plot of the ambiguity function obtained by applying the command at p. 74
`>> ambifunb(sig);`
does not give the plot in Fig. 4.13, but a plot which is inverted as regards to the y-axis, so that the position of the interference terms in the time-frequency plane coincides with those of the two chirps.
5. At the end of p. 78 there is written "Phi" instead of its symbol: I think you missed a backslash in the latex file.
6. The file `movcw4at.m` which is in the directory `tftb-0.1/data/` cannot be read. I could get the sequence in Fig. 4.15 by giving the command I found in the demo file, i.e.
`M=movcw4at(128);movie(M,10);clear M;`
7. Could you add in the text the commands to create the data for Figs 4.16 and 4.17?
8. This is only for a maybe silly matter of clarity. Since you say "affine smoothed pseudo Wigner distribution" (ASPWD), why don't you call the corresponding function `tfraspw` instead of `tfrspaw`? Or, alternatively, why don't you call the distribution the "smoothed pseudo affine Wigner distribution" (SPAWD)?
9. There is no file `movsc2wv.mat`, so, again, I used the command of the corresponding demo
`M=movsc2wv(128,15);movie(M,5);clear M;`
to get the sequence in Fig. 4.19. BUT this seems to calculate the "Smoothed pseudo Bertrand distribution" (what appears at the display) instead of the "Affine smoothed pseudo Wigner-Ville distribution". I checked in the files: in `movsc2wv.m` the calling of the function has the following parameters:
`[tfr,t,f]=tfrspaw(sig,t,0,Nh0(k-1),Ng0(k-1),fmin,fmax,Nf,1);`
where the last parameter is the value given to `trace`. In `tfrspaw.m` I find (lines 98 to 110):
`if trace, if (K==-1),
disp('Smoothed pseudo (active) Unterberger distribution');
elseif K==0,
disp('Smoothed pseudo Bertrand distribution');
elseif K==1/2,
disp('Smoothed pseudo D-Flandrin distribution');
elseif K==2,
disp('Affine smoothed pseudo Wigner-Ville distribution');
else
disp('Smoothed Pseudo Affine Wigner distribution');
end;
end;`
There is no possibility for `trace=1` so the program must consider the default value 0 and calculate the pseudo Bertrand distribution. Maybe line 63 of `movsc2wv.m` should be changed in:
`[tfr,t,f]=tfrspaw(sig,t,0,Nh0(k-1),Ng0(k-1),fmin,fmax,Nf,2);`
10. Concerning the examples at pages 91 to 94, why do you use different signals? Wouldn't it be clearer to compare the action of the distributions on the same signal?
11. I tried changing the number of color levels in the example on p. 95. After three successive changes I got the following message
`>> sig=anapulse(128);
>> tfrwv(sig);
Old number of levels: 64.000000
New number of levels: 32 % first change
Old number of levels: 32.000000
New number of levels: 128 % second change`

```
warning : the colormap size has been increased by identical vectors
You should redefine the colormap
Old number of levels: 128.000000
New number of levels: 64           % third change
??? Index exceeds matrix dimensions.
```

```
Error in ==> tfrqview at 296
MyMap = colormap; MyMap=MyMap(1:levelnumb,:); colormap(MyMap);
```

```
Error in ==> tfrwv at 82
tfrqview(tfr,x,t,'tfrwv');
```

and the plot I got is slightly different from the one in Fig. 4.24.

12. In the example at p. 105, the command
`sig=hilbert(bat(801:7:800+N*7)')`;
should be replaced by
`sig=hilbert(bat(801:7:800+N*7))`;

13. At the beginning of § 4.3.1, p. 108, "analyze" should be replaced by "analysis".

Chapter 5

1. In the example at p. 135, `holber` should be replaced by `holder`.
2. At the end of p. 135: *The same conclusions can be observed from the active Unterberger distribution....could you show how? with which parameters?*

tfdemo1

During the execution of the 2nd example

```
% First, load the signal from the MAT-file bat.mat :
echo off
```

```
I can't find ../data/bat.mat
```

```
name of the directory where bat.mat is :
```

I wrote the right path and everything was fine. But then I discovered that it finds the data and continues even if the name is not given! I suggest to eliminate this useless alert message.

tfdemo3

Same problem as in demo n. 1, this time for the file `gabor.mat`.

tfdemo4

1. The movie sequence obtained by the demo is different from that of Fig. 4.3 and the distribution on each atom is not symmetric with respect to the atom center.
2. Same problem found at Chapter 4, point 4.
3. About the "Comparison of parametrization functions":

```
echo off;
%
% PARAMFUN does not exist.
%
% You haven't created "paramfun.mat". Please run ??? to proceed.
% The next part of the demo is skipped.
%
echo off;
```

What is to be run?

NB: There was no `paramfun.m` in the `demo/` directory so the demo stopped. I found one in an old version of the toolbox: the demo does not stop now but it does not work properly either.

tfdemo5

1. This might be a problem of Matlab 7.1.0.183 (R14) Service Pack 3 on Mac, but the demo causes MATLAB crashes (100% of the times) while performing "The affine smoothed pseudo Wigner distribution" if one answer "n" to the question:

The next step requires patience. Do you want to skip it ?

2. The example at p. 95 leading to Fig. 4.24 is skipped by the demo.
3. Concerning the example on p. 105,
% Here are two examples of such distributions, analyzed on a real
% echolocation signal from a bat :

echo off

I can't find ../data/gabor.mat

name of the directory where gabor.mat is :

In the last sentence, "gabor.mat" should be replaced by "bat.mat" (just a mistype in tfdemo5.m). However, as in demos 1 and 3, the program continues even if no path is given...

4. ...and then it stops

```
N=2048; sig=hilbert(bat(400+(1:N)))';
```

```
??? Index exceeds matrix dimensions.
```

```
Error in ==> tfdemo5 at 241
```

```
N=2048; sig=hilbert(bat(400+(1:N)))';
```

clearly because size(bat) ----> 2048. In the tutorial (p.105) there is instead

```
>> N=128; sig=hilbert(bat(801:7:800+N*7))
```

```
>> tfrwv(sig)
```

and this produced the plot in Fig. 4.30. I could not go further in testing this demo.

tfdemo7

1. MATLAB randomly crashes while executing this demo, in correspondence of the movie command or of the programs creating the snapshots, such as movpwdph.m or movpwjph.m. It is weird that the same commands given line-by-line do not cause any problem and are correctly executed. Once again, this might be a problem of Matlab 7.1.0.183 (R14) Service Pack 3 on Mac.
2. Concerning the application starting at p. 130, only the 3D plot are shown in the demo: Fig. 5.3 (p.131) and Fig.5.5 (p. 133) are not reproduced.
3. The example leading to Figs. 5.7 and 5.8 is not included in the demo.

Finally, on the whole of the tutorial and demos. Since I had noticed that almost all the contour plots in the tutorial are much less noisy and much more readable than the ones I got following the commands or running the demos (especially in the case of Figs. 4.30, 4.32, 4.38, 5.3 and 5.5), I tried to use directly the command `contour()`, specifying the number of the contour lines. I tried many different values. I always get noisier plots. Could you give, at least in the text, the commands you used to plot the figures?