
Subject: Need help with Wavelet Workbench

Posted by [jkbishop](#) on Wed, 07 Apr 1999 07:00:00 GMT

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I'm trying to use Wavelet Workbench on a long (48000 pt) signal. I think that two separate problems are occurring.

I upsampled the data set to 65536 points (by zero padding in frequency space). I hacked wreaddat, wdyadlng, wdyad, and wfwtpo to use long integers in some places. The result is that I can now plot the scalogram for my data set (wreaddat, wintwave, wdoscog are the programs I'm calling). However, the plot of the scalogram looks like only the first half of the data set is being used. The coarser scales have some variation just beyond the half-way point (bleed-over from the convolution process?), but the more detailed scales show a solid color in the upper half of the time axis. Anyone have any ideas what is going on?

So far, I have tried upsampling again to 2×65536 points (whatever that is). The result is that the convolution-by-FFT process in wmfilt takes forever (I didn't wait for it to finish; it was taking at least 10 times as long as the 65536 point set, as verified by printed status statements). I don't understand why, but would the FFT process be the problem with the 65536 data set?

To get an answer, my next approach was to downsample to 32768 points. This brings me to the second problem, which is a type conversion problem in wintwave. For the 65536 point data set, this part seems to work fine (with the adjustment of 2 to 2L in the line that finds n_work). When I put the 32768 point set in, the data set gets truncated to 16384 points because $\text{fix}(\text{alog}(\text{n_elements}(\text{x_work}))/\text{alog}(2)))$ evaluates to 14 instead of 15. $\text{alog}(\text{n_elements}(\text{x_work}))/\text{alog}(2))$ is given as 15.0000. Can someone explain this so even a mechanical engineer can understand? To get around this one, I have just inhibited the length check; I just have to be careful to only use dyadic length sets.

Any help would be appreciated.

--

Jonathan Bishop

jkbishop at frontiernet dot net

jab7981 at rit dot edu

Subject: Re: Need help with Wavelet Workbench

Jonathan Bishop wrote:

>
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> color in the upper half of the time axis. Anyone have any ideas what
> is going on?

This scalogram is from the Matlab Wavelab code. I translated it as is. It is pretty strange code to me, and I never went back and did anything with it to make more sense of the results and display. The idea is that you should see another representation of the values of your wavelet coefficients at each 2^n scale.

The discrete wavelet transform results are much more intuitive to me, and that's what I rely on, instead.

Feel free to hack up that scalogram code (I don't know when I will get around to working on that part.)

Also the scalEgram (note the "e" difference) calculates the absolute power of the wavelet coefficients, (but I have to use a Haar wavelet for integrating over the scale, see the notes to the software about why I (and the WaveLab folks) do it that way). So perhaps that scalegram would be a more useful representation of your transformed coefficients.

Hope this provides some insight,

Amara

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"Never fight an inanimate object." - P. J. O'Rourke

Subject: Re: Need help with Wavelet Workbench
Posted by [Amara.Graps](#) on Thu, 08 Apr 1999 07:00:00 GMT
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In article <370b984c.55748962@news.rit.edu>, jab7981@nospam.rit.edu wrote:

>
> The result is that WWB only works for datasets < 32768 in length
> rather than <= 32768 in its original form.
>

Dear Jonathan Bishop,

I can answer this, and I think t's time to say something about Wavelet Workbench (WWB).

I'm the author of WWB. About 2/3 of WWB is code that I translated with (D. Donoho's) permission from the Matlab WaveLab algorithms and software, and the rest of WWB is my algorithms and software.

I developed WWB in IDL v4.0.1 on my old Macintosh.

Yes, WWB is old, and yes I have access to IDL version 5 on a Sun at my Institute, but my time is severely limited for me to spend much time away from my PhD while I'm at my Institute, in order to develop that software for the public.

Yes, I understand that that public version of WWB is crippled in many ways. I was hoping that many folks would see the code of the open routines and upgrade and develop it themselves. I know of some people that have made the necessary changes to have WWB run for arrays > 32767 and on newer version of IDL. (It's not a trivial change, but it is doable.)

In the last 1 1/2 - 2 years that I released that Wavelet Workbench publically, I've added a fair bit of new code to my own copy of that software, but mostly to support my own research work on Galileo data.

The extra bit of work for me to update the WWB manuals and to make more examples has been prohibitive enough to prevent me from making a new release of Wavelet Workbench. And I've had substantive changes in my real world that have stopped me from finding time to do such

things. (Try moving to a foreign country, where everything is well.. "foreign" and becoming a graduate student.. that will put a major crimp on one's life) My free time every day is on the order of minutes ...

Yes, I have made the changes to WWB to work on >32 767 size arrays.

Yes, I've doubled the number of wavelet bases available.

Yes, I've added a continuous wavelet transform. (I'm adding wavelet-ridge-finding for instantaneous frequencies now.)

Yes, I've fixed quite a few little bugs here and there.

Yes, I have a number of very nice new examples and excercises, from my own work, as well as the result of other people's use of WWB, but they are not written up in the manual yet.

No, I have not worked on any "speed" issues, to speed up WWB.

Since I'm in the middle of a large number of big changes with the software, I don't wish to make a public release now.

Would you be interested in a version from last summer that solves that "32,767" problem? That older version of WWB was "stable" (for me, that is) for some time before my current frenzy of modifications of the code. That's the best I can offer right now.

I'll put it at my personal server this evening:

ftp://ftp.amara.com/wwb_winter.tar.gz

And I will leave it up until April 12. Anyone else that wants a little bit newer version of the WWB code can grab it too. (Sorry I can't leave it up longer, but every Internet usage costs me, and I'm living on a PhD stipend you see...)

Sincerely,
Amara

P.S. I'll be on travel for a large part of April. Sorry I can't do more!

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