Subject: Re: time series analysis - request for ideas?
Posted by oxfordenergyservices on Fri, 24 Sep 2010 13:02:39 GMT
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On 21 Sep, 17:35, "R.G. Stockwell" <noem...@please.com> wrote:
> "a" <oxfordenergyservi...@googlemail.com> wrote in message
>
> news:da83c4e7-1249-4a7e-8138-90bce4e37df0@l17g2000vbf.google groups.com...
>
>
>
>
>
>> Hi
>
>> I have a number of experimental time-series data (say 100) each of
>> which consists of a number of readings at 10 second intervals for a
>> year.
>
>> I want to simulate many thousand of these time-series but they must
>> agree statistically with the experimental data.
>
>> Does anybody have any ideas of how this might be done or the types of
>> fields that this problem has come up in?
>
>> My initial thoughts were
>
>> a) the distribution of values of the simulated must agree with
>> experimental
>> b) the distribution of (the change in each 10 seconds) must agree with
>> experimental
>> c) the autocorrelations of the simulation must agree with experimental
>
>> The experimental data does not look like it can be used with fourier
>> analysis - there are lots of spikes, lots of plateaus and lots of very
>> low contiguous values etc.
>
>> Any ideas appreciated
>
>> Cheers!
>
>> Russ
>
> I would fit to find what kind of autoregressive process it appears to be.
> Check out the power spectrum, and if it is a red spectrum (which is fairly
> universal
> in geophysics) just create an autoregressive process to mimic the spectral
> slope.

>
> (I.e create a time series from random white data, make an recursive filter
> to tune
> the spectra to look like the real thing).
>
> for example: (you can put in your own alpha, or change how many lags you
> want)
>
> function rednoise,len
>
> ; rewrite to calc all random numbers at once.
>
> randomnumbers = randomn(seed, len)
>
> alpha = 0.99d ; the one-lag autocorrelation of the red noise
>
> factor = sqrt(1-alpha^2)
> x = dblarr(len)
> x(0) = factor*randomnumbers[0];
> for i=1L,len-1 do begin
> x(i)=x(i-1)*alpha + factor*randomnumbers[i];
> endfor
>
> return,x
>
> end

Thanks RG

I'll take a look. One of the issues I have with the datasets is that
they do not really resemble noise, white or red. There a periods of
quietness, then periods of plateaus etc. Quite hard to model.

Thanks

Russ
