
Subject: How to find the confidence interval of a variable data at 95% or 66%?

Posted by [atmospheric physics](#) on Mon, 18 Aug 2014 20:07:30 GMT

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Dear All,

I have a few clarifications regarding finding the confidence interval (CI) of a variable data. As referred to the Fisher Z Transformation method, I find some clarity missing:

http://www.idlcoyote.com/code_tips/ccconf.php

1. "The number 1.96 comes from a table of critical values for normalized distributions for 95% CI". Can any one say what will be this value for 66% CI? When I referred to Shen and Lu paper, I find that this factor 1.96 is defined by $z(1-\alpha/2) = 100*(1-\alpha/2)$. It was mentioned that $\alpha = 0.05$ for 95% CI, but I could not understand how 1.96 is obtained. Can anyone clarify?

2. Can I find the CI on any variable parameter, say, variance of a data array, instead of correlation coefficient? If it is acceptable, then following the above link, I define as below:

$\text{fishersz} = 0.5 * (\log(1 + \text{var_X}) - \log(1 - \text{var_X}))$; Fisher's Z-transformation

...
...
...

Please provide me some insight on how I can find the CI at any % level?

Thanking you in advance,
Madhavan

Subject: Re: How to find the confidence interval of a variable data at 95% or 66%?

Posted by [Craig Markwardt](#) on Tue, 19 Aug 2014 03:35:29 GMT

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On Monday, August 18, 2014 3:07:30 PM UTC-5, Madhavan Bomidi wrote:

> Dear All,

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It's in the Shen and Lu paper. z is the $100 \cdot (1 - \alpha/2)$ percentage point of the standard normal distribution. Examples,

```
IDL> print, gauss_cvf((1 - 0.95d)/2)
1.9599637
IDL> print, gauss_cvf((1 - 0.99d)/2)
2.5758293
```

> 2. Can I find the CI on any variable parameter, say, variance of a data array, instead of correlation coefficient? If it is acceptable, then following the above link, I define as below:

The confidence interval of a variable depends on the statistical distribution of the variable. In the correlation coefficient example, the variable has a Fisher-z distribution.

For another type of variable, such as variance of a data array, you must first describe the statistical properties of the data array. Most likely it will not be a Fisher-z distribution, and there may not be any known distribution.

CM

Subject: Re: How to find the confidence interval of a variable data at 95% or 66%?
Posted by [atmospheric physics](#) on Tue, 19 Aug 2014 05:28:31 GMT
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Hello Craig Markwardt,

Thanks for the info about z calculation in Fisher Z transformation. How can we know whether a data array is of Fisher-z distribution? Supposing we don't know what the distribution of a data array, say random number array or some unknown variable data, how can we ascertain which distribution the data array represent from the known statistical parameters?

Any references will be helpful.
Thanking you in advance.
Regards,
Madhavan

Subject: Re: How to find the confidence interval of a variable data at 95% or 66%?
Posted by [Craig Markwardt](#) on Tue, 19 Aug 2014 13:06:25 GMT
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On Tuesday, August 19, 2014 12:28:31 AM UTC-5, Madhavan Bomidi wrote:

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> Thanks for the info about z calculation in Fisher Z transformation. How can we know whether a data array is of Fisher-z distribution? Supposing we don't know what the distribution of a data array, say random number array or some unknown variable data, how can we ascertain which distribution the data array represent from the known statistical parameters?

You need prior knowledge. If the data samples are drawn from a normal distribution then the following formulation may help.

http://en.wikipedia.org/wiki/Variance#Distribution_of_the_sample_variance

If the data samples are drawn from another distribution such as Poisson, then a different formulation would apply.

If you don't know, then you really need many sample vectors and then you can estimate the behavior of the system empirically.

CM
