Subject: Re: Maximum likelihood question (ENVI)
Posted by Mort Canty on Fri, 09 Jan 2004 07:47:51 GMT
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Jonathen Greenberg writes:

"Jonathan Greenberg" <greenberg@ucdavis.edu> schrieb im Newsbeitrag
news:BC22E9A9.18624%greenberg@ucdavis.edu...
> Mort:
>
>   Did RSI send you ANYTHING? Could you post them to the newsgroup?
Also,
> is there a program to do the Richard's method, or did you code it directly
> from a publication? Thanks!
>
> --j
>

Jonathan:

Right, after some searching in the dead letter department I found it:

Dear Dr. Canty,

Fist of all our apologies for the delay.

From Research System we now received the requested background information on
rule images regarding the Maximum Likelihood supervised classification.

It is important to keep in mind that the "probabilities" calculated by ENVI
3.5 and prior versions are not true probabilities. The values that ENVI
reports as probabilities are normalized discriminant function values.
Therefore, the probabilities reported by ENVI do not behave as true
probabilities would. For example, if for some pixel the discriminant
function values are all small (i.e., the pixel is not similar to any of the
classes), then the probabilities reported by ENVI will still sum to one. If
true probabilities were calculated in this case, then the probability for
each class would be small, and the sum of probabilities would be
significantly smaller than one.

Therefore the ENVI developers had received a request to change ENVI's
Maximum Likelihood classification to use the non-normalized $g_i(x)$ values in
the rule images.

This request had been considered for ENVI 3.6.

Now the rule images, one per class, contain a maximum likelihood

discriminant function with a modified Chi
Squared probability distribution. Higher rule image values indicate higher
probabilities. The final classification allocates each pixel to the class
with the highest probability. The negative values should indicate
unclassified pixels that do not fit the parameters established in the
initial classification.

To convert between the rule image's data space and probability, use the Rule
Classifier. For the classification threshold, enter the probability
threshold used in the Maximum Likelihood classification as a percentage
(e.g., 95%). The Rule Classifier will automatically find the corresponding
rule image Chi Squared value.

It is even possible to find the rule image Chi Squared value that equals the
probability threshold, entered as a percentage. Please follow these steps:

1. Display a rule image
2. Select Enhance->Interactive Stretching...
3. In the Interactive Stretching Dialog box, select Histogram_Source->Band
4. You can now move the cursor in the Input Histogram to determine
Chi-Squared value (or DN) which match the cumulative probability in
percentage. The output information is on the lower left corner.

Hope this is helpful!

It wasn't. I want, like you, to access the class membership probabilities
programmatically. I don't know if there exists any software for PLR. I coded
it in IDL from Richards' description in his book "Remote Sensing Digital
Image Analysis".

Mort