
Subject: Theil–Sen estimator anyone?

Posted by [bstecklu](#) on Sun, 20 Jan 2013 07:41:26 GMT

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Is there an IDL implementation of the Theil–Sen estimator, also known as Kendall robust line-fit method? I'm aware of `robust_poly_fit.pro` but that's not quite the same.

Bringfried

Subject: Re: Theil-Sen estimator anyone?

Posted by [bstecklu](#) on Wed, 05 Feb 2014 13:37:23 GMT

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On Sunday, January 20, 2013 8:41:26 AM UTC+1, bstecklu wrote:

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>
>
>
> Bringfried

To answer my own question here is a basic implementation.

; perform Theil-Sen robust linear regression

; cf. https://en.wikipedia.org/wiki/Theil%E2%80%93Sen_estimator#CI_TEREFSen1968

function ts,x,y

```
n=n_elements(x)
xx=x#replicate(1,n)
xx=xx-transpose(xx)
yy=y#replicate(1,n)
yy=yy-transpose(yy)
ts=yy/(xx+(xx eq 0))
idx=where(xx ne 0)
ts=ts[idx]
;sort
ts=ts[sort(ts)]
; slope
a=median(ts)
; constant
b=median(y)-a*median(x)
np=n*(n-1)/2.
```

```
; 95% confidence interval for slope, cf. http://pubs.usgs.gov/tm/2006/tm4a7/
z=1.96*sqrt(n*(n-1)*(2*n+5)/18.)
ru=ts[round((np+z)/2.+1)]
rl=ts[round((np-z)/2.)]
;done
return,[a,b,rl,ru]
end
```
