
Subject: algorithm question. Can I get rid of the for loop?
Posted by [Søren Frimann](#) on Thu, 21 Mar 2013 21:32:15 GMT
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Hi All.

I have an implementation of a hampel filter (see e.g.
<http://exploringdatablog.blogspot.dk/2012/01/moving-window-filters-and-pracma.html>) in IDL.

My implementation looks like this:

```
#####  
FUNCTION hampel, x, y, dx, THRESHOLD=threshold  
  
Compile_Opt idl2  
  
IF N_Elements(threshold) EQ 0 THEN $  
    threshold = 3  
  
;initialize arrays  
s0 = FltArr(N_Elements(y))  
y0 = FltArr(N_Elements(y))  
yy = y  
  
FOR i=0,N_Elements(y)-1 DO BEGIN  
    index = Where((x GE x[i] - dx) AND (x LE x[i] + dx))  
    y0[i] = Median(y[index]) ; Median filtering  
    s0[i] = 1.4826*Median(Abs(y[index] - y0[i])) ;estimating uncertainty  
ENDFOR  
  
ol = Where(Abs(y - y0) GE threshold*s0) ;Index of outliers  
yy[ol] = y0[ol]  
  
result = Create_Struct('y',yy, $  
    'sigma',s0)  
  
RETURN, result  
  
END  
#####
```

the filter runs a moving window of width $2*dx$ measured in the same units as x .
 x is generally not uniformly spaced (so there's not a constant number of points inside the window as it moves).
 x and y can be quite long vectors so the filter takes a long time to run.
Can anyone see any method for speeding the code up?
Any help would be much appreciated!

Cheers,
Søren
