
```

function [h,V,npairs] = semivariogram_mc(x,y,np)
% simple variogram function for equally spaced data
% Input
% x = distance vector
% y = measurement vector
% Output;
% h = lag distance
% y=semivariogram result
% SNTX: [h,y, npairs] = semivariogram(x,y, np)
dx = mean(diff(x)); %average spacing
extent = (max(x) - min(x)); % extent
N = length(x); %number of data points
h = dx:dx:extent/2 ; % lags --> only calculating to half the extent to avoid
    bias
npairs = zeros(length(h), 1); %preallocate npairs
V = zeros(length(h),3); %preallocate semivariance
for n = 1:length(h) %loop over lags
    npairs(n) = N-n; % number of pairs at each lag
    Iu = 1:(N-n); % define the index of the head
    Iv = (n+1):N; % index to tails
    V(n) = 1/(2*npairs(n))*sum((y(Iu)-y(Iv)).^2); %semivariance
    Vt = zeros(10,1);
    for m = 1:10 %monte carlo for uncertainties
        I2 = randsample(Iu, np); %randsample of pairs
        Iut = Iu(I2);
        Ivt = Iv(I2);
        Vt(m) = 1/(2*npairs(n))*sum((y(Iut)-y(Ivt)).^2); % semivariance of
    randsample
    end
    V(n,:) = quantile(Vt,[0.025 0.5 0.975]);
end

```

~~Not enough input arguments.~~

~~Error in semivariogram_mc (line 10)~~
~~dx = mean(diff(x)); %average spacing~~

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