
computeBetaYhatResiduals

```
function [betas, Yhat, residuals] = computeBetaYhatResiduals(X,Y)
% Takes a design matrix X and data Y to fit.
% Returns the betas of the regressors, the Yhat afther fitting and
the
% resial errors. NOTE: There MUST be a way to do this without the for
loop
% but I cant figure out how to do this. Following the slides:
% X\Y, with
% X: 5x360
% Y: 153.594x360
% Results in a,
%Error using \
%Matrix dimensions must agree.

%For later ease of use.
xm = size(Y, 1);
ym = size(Y, 2);
zm = size(Y, 3);
nscans = size(Y, 4);
bm = size(X,2);

%init vectors/matrices
betas = zeros(xm*ym*zm,bm, 'single');
Yhat = zeros(xm*ym*zm,nscans, 'single');
Y = reshape(Y, [xm * ym * zm, nscans]);

%Regress
for i = 1:xm*ym*zm
    betas(i,:) = regress(Y(i,:)', X);
    Yhat(i,:) = betas(i,:) * X';
end

%Calc residuals
residuals = Y - Yhat;

%reshape into matrices
Y = reshape(Y, [xm, ym, zm, nscans]);
Yhat = reshape(Yhat, [xm, ym, zm, nscans]);
betas = reshape(betas, [xm, ym, zm, bm]);
residuals = reshape(residuals, [xm, ym, zm, nscans]);
end
```

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