

## Re: Help on Partial Least Squares Aalgorithm

**Source:** <http://sci.tech-archive.net/Archive/sci.stat.math/2005-02/0403.html>

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Paige Miller <[paige.miller@kodak.com](mailto:paige.miller@kodak.com)> wrote:

> *Beorne wrote:*

>> *The PLS algorithm (on one target variable) does regression on some*

>> *specific subsapace*

>> *The regression problem is:*

>>  $y = XWQ + e$

>> *where y is a single variable target vector nx1,*

>> *X is a data vector nxP*

>> *W is a subspace of X of pxk dimension (with k<p)*

>> *Q are the kx1 regression coefficients.*

>> *T=XW is the score plot.*

>>

>> *I need the W matrix of PLS only for visualization purpose, i.e. I have*

>> *to plot the score like a PCA.*

>> *How can I calculate directly the subspace W? I don't want to use the*

>> *more complex PLS algorithms (NIPALS or SIMPLS) that suppose that I have*

>> *more than one target variables and give me the regression coefficient*

>> *matrix Q I don't need.*

>>

>> *In short: what is the formula to calculate W from X and y? (i.e.: fr*

>> *PCA the W space is the k-biggest eigenvalue corresponding eigenvector*

>> *space of X'\*X given X standardized)*

> *So let's see ... you don't want to use existing, well-established*

> *algorithms because they give you stuff you don't want, and that*

> *extra calculation is expensive.*

> *Now there are ways to rewrite the PLS algorithm using an eigenvector*

> *decomposition ... but darn it all, you not only get the*

> *eigenvectors, but other stuff you don't want like eigenvalues, and*

> *eigenvectors for dimensions you don't want. And this method requires*

> *even more calculations than the NIPALS or SIMPLS algorithm anyway.*

> *I guess I can't help you.*

> --

> *Paige Miller*

> *Eastman Kodak Company*