

User Notes: IMP PLS3D

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The PLS3D program is a beta version of a 3 dimensional landmark data based partial least squares analysis tool. It will carry out a partial least squares analysis of the covariance structure between two blocks of variables measured on a single set of specimens. One block must be landmark data, while the second block can be either landmark data or continuous variables of any other type (traditional morphometric measurements or ecological variables for example).

The program is currently a Beta version, but all the underlying code and statistical aspects of the program operation were derived from the well-tested PLSBlock program for 2D data. Don't hesitate to contact me if you have questions.

This document is not meant as a complete user's manual for the program, only as a brief sketch of its' operation. As time allows, I will try to produce a more complete user's manual. I currently lack any good data sets to use as examples with this program (there are example files included, but these are randomly generated artificial examples).

For any explanation of partial least squares analysis, see Rohlf and Corti (2001) or Zelditch et al (2004). Also please see the 2D IMP programs PLSMaker and PLSAngle for further information on PLS and SVD (singular value decomposition methods). For information about the IMP 3D programs please see the Simple3D program and the ThreeDPCA programs and their user manuals.

File Requirements:

The program computes patterns of covariance between blocks of data. You will need at least one data file of 3D landmark data in the IMP 3D format (see the Simple3D program). Your second data file may be 3D landmark data (in the IMP format), or non-geometric data (see the PLSMaker manual for file format for non-geometric data).

You will also need a wire frame listing file, see the Wireman tool for editing wireframe files or the ThreeDPCA or Simple3d programs and manuals for instructions on wireframes.

Operation:

- 1.) Load the wireframe first.
- 2.) Load data set 1, your first block of data, which must be landmark data.
- 3.) Set the selection button to either landmark data for block two (which is the default) or non-landmark data.

4.) Click the 2 block SVD button to carry out the PLS analysis.

5.) The active SVD axis up and down buttons control which SVD axis you are working with at any point. The plot axes buttons for each plot will plot the current SVD axis. Various plot control options are available.

6.) The permutation test button carries out a permutation test of the significance of the observed axis. A box is provided to set the number of permutation tests desired. Please see the PLSBlock manual for a discussion of this test. Results will be shown in the AuxBox Window.

Example Files

sq10.txt- These two files are landmark data files in the IMP 3D format
tr10.txt Use these two files as blocks 1 and 2

sq10_rand_cov.txt- This is a random covariate file for use with sq10.txt, it is a
matrix with random values

sqwire.txt- This is the wireframe file for use with the examples.

If you have a biological example for 3D PLS please get in touch!

-Dave