1 Program 3dANOVA3

1.1 Purpose

Program 3dANOVA3 was developed to perform crossed and crossed-nested three factor analysis of variance (ANOVA) on *AFNI* 3-dimensional data sets. Five different ANOVA models are available, which are described below. Although these models do not cover every possible situation for three factor ANOVA, they should suffice for most practical purposes.

The command line inputs allow the user to specify which *AFNI* data sets are to be used in the analysis, and to which factor levels they belong. Various output options are available, including F-tests for main factor effects, F-tests for factor interactions, estimation of individual factor level means, estimation of the difference between two factor level means, and estimation of contrasts. For the "fixed effects model" (Model 1, described below), additional output includes estimation of individual cell (treatment) means, and differences in cell means, along with their corresponding statistics. The resulting output may be stored either as multiple *AFNI* 2 sub-brick datasets, or as a single *AFNI* "bucket" type dataset.

Program 3dANOVA3 requires **equal sample sizes** for all combinations of factor levels.

1.2 Further Details

For further details, see Section 3 of *Analysis of Variance for FMRI Data*, contained in file 3dANOVA.ps.