

spm analyse page]]. this page includes: * visualizing the [\[\[sift:application:analyse_page#mapping|maps\]\]](#); * visualizing the [\[\[sift:application:analyse_page#statistics|statistics\]\]](#); ===== tutorials ===== for a step-by-step example of how to use sift to perform spm on your data, and to interpret the results, see the [\[\[sift:tutorials:perform_statistical_parametric_mapping|spm tutorial\]\]](#). ===== reference ===== our implementation of statistical parametric mapping is based on the article: pataky tc (2010) generalized n-dimensional biomechanical field analysis using statistical parametric mapping. journal of biomechanics 43. 1976-82 ([\[\[https://doi.org/10.1016/j.jbiomech.2010.03.008|1\]\]](https://doi.org/10.1016/j.jbiomech.2010.03.008)) ****abstract**** a variety of biomechanical data are sampled from smooth n-dimensional spatiotemporal fields. these data are usually analyzed discretely, by extracting summary metrics from particular points or regions in the continuum. it has been shown that, in certain situations, such schemes can compromise the spatiotemporal integrity of the original fields. an alternative methodology called statistical parametric mapping (spm), designed specifically for continuous field analysis, constructs statistical images that lie in the original, biomechanically meaningful sampling space. the current paper demonstrates how spm can be used to analyze both experimental and simulated biomechanical field data of arbitrary spatiotemporal dimensionality. firstly, 0-, 1-, 2-, and 3-dimensional spatiotemporal datasets derived from a pedobarographic experiment were analyzed using a common linear model to emphasize that spm procedures are (practically) identical irrespective of the data's physical dimensionality. secondly two probabilistic finite element simulation studies were conducted, examining heel pad stress and femoral strain fields, respectively, to demonstrate how spm can be used to probe the significance of field-wide simulation results in the presence of uncontrollable or induced modeling uncertainty. results were biomechanically intuitive and suggest that spm may be suitable for a wide variety of mechanical field applications. spm's main theoretical advantage is that it avoids problems associated with a priori assumptions regarding the spatiotemporal foci of field signals. spm's main practical advantage is that a unified framework, encapsulated by a single linear equation, affords comprehensive statistical analyses of smooth scalar fields in arbitrarily bounded n-dimensional spaces. }}

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