Interclass Statistical Tests on Objects
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The problem I discuss is the discrimination between two classes of objects, e.g., an anatomical object from a diseased individual vs. one from a healthy individual. Two different forms of such discrimination are classification and multi-feature hypothesis testing to determine whether there are geometric differences between the classes and what they are. A form of object representation suited to such statistical tests is needed, and such a representation must be fitted to each of the training cases. Moreover, because rich geometry involves both features that are Euclidean and features, such as directions, that live on abstract spheres, the classification and hypothesis testing methods must be designed to analyze populations of such feature tuples. With analysis of hippocampi of schizophrenic vs. healthy individuals as the target problem, I will first present why skeletal models are particularly effective for these tests on objects and how to fit of these models to the training data. Then I will present a classification method and a hypothesis testing method that have the necessary capabilities, and I will present the successful analyses on the two classes of hippocampi.