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*Distances between surfaces, with biological applications.*

The talk describes new distances between pairs of two-dimensional surfaces (embedded in three-dimensional space) that use both local structures and global information in the surfaces. This is work done by a collaboration of mathematicians, computer scientists and biologists.

These are motivated by the need of biological morphologists to compare different phenotypical structures. At present, scientists using physical traits to study evolutionary relationships among living and extinct animals analyze data extracted from carefully defined anatomical correspondence points (landmarks). Identifying and recording these landmarks is time consuming and can be done accurately only by trained morphologists. This necessity renders these studies inaccessible to non-morphologists and causes phenomics to lag behind genomics in elucidating evolutionary patterns.

We develop an approach that does not require any preliminary marking of special features or landmarks by the user, and that leads to fast implementation for pairwise comparison of surfaces. (Received September 25, 2013)