



## Similarity Functions

### 1 Why

We want to say how close two elements of a set are. In other words, we want a function which associates two objects of a set with a real number quantifying how similar they are. The intuition comes from distance functions.

### 2 Definition

A *similarity function* is a function on a cross product of a set with itself that is zero on all ordered pairs whose first and second coordinates are the same. Notice that a similarity function can associate zero with ordered pairs of different elements also. That is, on pairs of non-identical elements. However, this value must be nonnegative. The similarity function may or may not be symmetric.