Normalisation Experiments: Planning, Deployment, and Analysis

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March 11, 2007

Abstract

This document outlines an augmented experimental plan. It contains a succinct proposition for experiments to be run, which in turn help us understand how to normalise assessors of non-rigid registration (NRR) that use appearance models. The core of these experiments involves two synthetic (randomly-drawn) distributions which are deliberately varied for the purpose of subsequent analysis. Additionally, different factor in the evaluation, such as the power to which differences get raised, are being investigated. The outcome of the experiments is of special interest in its own right, yet it also helps provide a more objective measure for real-world applications and makes the evaluation framework we have more valuable.

1 Outline of Experiments

Several experiments that fall under the same theme have already been run. They are summarised in a weekly progress[1]. Below we have listed a list of experiments whose educational value justifies systematic variation of one parameter or another.

1. Varying $|\cdot|$: Does one get the same behaviour when changing from a Euclidean distance to a shuffle distance? If the variation as function of set size is linear (i.e. we get a straight line as before), does it have the expected slope? Do we even get a straight line at all?

2. Using the first and second nearest neighbour distances. Does one still get a straight line? We could look at the mean of the first and second nearest neighbour distances separately. Do we get a straight line for one but not the other as you vary n? We can then repeat the experiments using shuffle rather than Euclidean distance.

3. Now try the effect of varying the dimensionality. Stick to the same sort of generating distributions, and see if you can the straight-line behaviour for higher d as well.

4. Try with some non-Gaussian distributions. I mean some sort of bent banana-shaped scatter, rather than anything like a flat distribution.

2 Results

3 Conclusions

[1] Report URL: http://schestowitz.com/Research/Progress/Reports/2005-2006/RSPRS098/