

Re: Locating An Image At Arbitrary Scales, Translations, and Rotations

Source: <http://sci.tech-archive.net/Archive/sci.image.processing/2009-03/msg00002.html>

- *From:* Randy Crawford <joe@xxxxxxxxxxxxxxxx>
 - *Date:* Sun, 01 Mar 2009 00:23:35 -0600
-

On Tue, 17 Feb 2009 21:45:10 -0500, Randy Yates wrote:

How does one do this? To begin assume the following idealized goal: we have a black background and a white rectangle with aspect ratio α at an arbitrary scale, translation, and rotation. How do we identify the translation (or location in the x-y plane) and rotation?

I am beginning to read the paper, "Coarse-Level Object Recognition Using Interlevel Products of Complex Wavelets" by Anderson, Kingsbury, and Fauqueur, but am unsure if this is even the right approach.

A question I can't seem to resolve with a quick perusal of the literature is this: Are approaches like those described by Anderson designed to identify *arbitrary* objects in the image that are a-priori unknown, or are they searching for an object that is known (and described somehow)?

Obviously I am a beginner in the field, so please make the appropriate allowances. I do know general maths and 1-D signal processing fairly well.

Translation is meaningful only if an object has moved from A to B. Location and translation are not the same thing.

It's not clear from your problem description what you're trying to do.

If your object really is just a rectangle, it's easy enough to find its center and corners, and then compare those values to a second rectangle. (look into morphological erosion or 'thinning' or 'corner detection' to extract that kind of info.)

If you need to find a known 'object' in a scale invariant way from an unknown image, there are several approaches. Look into "Scale Invariant Feature Transform (SIFT)" by Lowe, or "Shape Contexts" by Belongie (fairly neat and simple), or if your 'rectangle' is complex and surrounded by variants, you might use a multiscale salient feature

Re: Locating An Image At Arbitrary Scales, Translations, and Rotations

extraction and match like that of Kadir & Brady, "Saliency, Scale, and Image Description". The latter works well with unknown objects since it extracts detail and builds models of objects and clusters objects that are similar as it goes.

Randy

.