1. Related Work

-Image Stylization

cartoon-like abstraction style to imitate hand-drawn hidden picture puzzles-Shape Matching

-Shape Matching

Shape context method of matching, which is simple but effective.

Improved the method slightly by adding rotation-invariance.

2. Preprocessing Steps

-Converting the Input Image to Line Drawing

Use the coherent line drawing(CLD) method by Kang et al.

after all the hidden objects are embedded into the background image, we apply CLD method again on the combined image to recalculate the edges

-Object Database

Constructed a database of objects (to be hidden) from a set of arbitrary images.

Convert into line-drawing using the CLD method, manually segment out the objects.

100 images with 300 X 300 resolution.

To improve the likelihood of good matches, mirror images of the objects were added to the database.

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3. Shape Matching

-Rotation-Invariant Shape Context

The shape context consists of a small number of histograms which express the spatial relation-ships among the points representing the shape, and allow a possible match between two given shapes to be evaluated quickly.

Extract the feature using Harris corner detection method.

use principal components analysis (PCA) to extract the representative axis of the set of feature points

-Computing Similarity

Using a dot product

-Finding Hidden Spot and Object Selection

use thin-plate spline (TPS) interpolation, which minimizes the number of wiggles in the interpolation surface

4. Object Transformation