Image Analysis on Hatching Drawings

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Introduction 1

This work applies image analysis techniques to pen-and-ink hatching drawings. A sample hatching illustration is decomposed into regions and strokes. A vectorized representation of the hatching strokes is created, enabling measurements such as the local width or direction along the strokes. This forms the basis for capturing the drawing style in a sample illustration within our approach dedicated to the automated

4 **Detection of Strokes**

Morphological operators are used to detect the strokes in the cutout regions. The first row shows an input region (left), on which connected component labelling is used to identify the strokes (middle). Thinning yields the skeleton (right). In the second row, we depict the input image overlayed with the skeletons and control points computed from the skeleton, which forms a vectorization of the hand-drawn strokes.



generation of hatching drawings by example.

Input 2

We work on binary black and white scans of hatching drawings. For the time being, we focus on a particular hatching style, one used in botanical and anatomical illustration with pen and ink.





5 Decomposition of Strokes

Shapes formed by overlapping strokes are decomposed based on an analysis of the skeleton. We compare the directions of the skeleton's segments at junctions and connect continuous segments to strokes. From such an input (left), a hit-or-miss transform yields endpoints and junctions (middle). The decomposition labels continuous strokes (right).

Manual Region3Segmentation

6 Refinement of Strokes

Similar hatching strokes are grouped with a manual segmentation (colored regions above). It serves as a means to capture where the artist has drawn which kind of strokes. Further, the segmentation allows to separate the strokes in each region from the rest of the drawing, which facilitates the detection of strokes.

Further refinement of the stroke skeletons is necessary, so as to prune residua of connected strokes from the skeleton (left), or to correct for deviations of the skeleton from the path of the original stroke (right).

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Information

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