Painting by Feature

We developed a novel example-based image synthesis technique that enables artists to paint in the visual style of the given photograph or an example of drawing medium. They can use entire exemplar as a palette, from which linear as well as areal structures can be selected and combined seamlessly into a new image which preserves visual richness of the given exemplar on the local level while on the global level respects prescribed structural properties. A key improvement over previous example-based techniques is that in our approach we treat salient texture boundaries independently from areal features and propose an algorithm how to synthesize them in a way that notably improves visual fidelity of the resulting image.

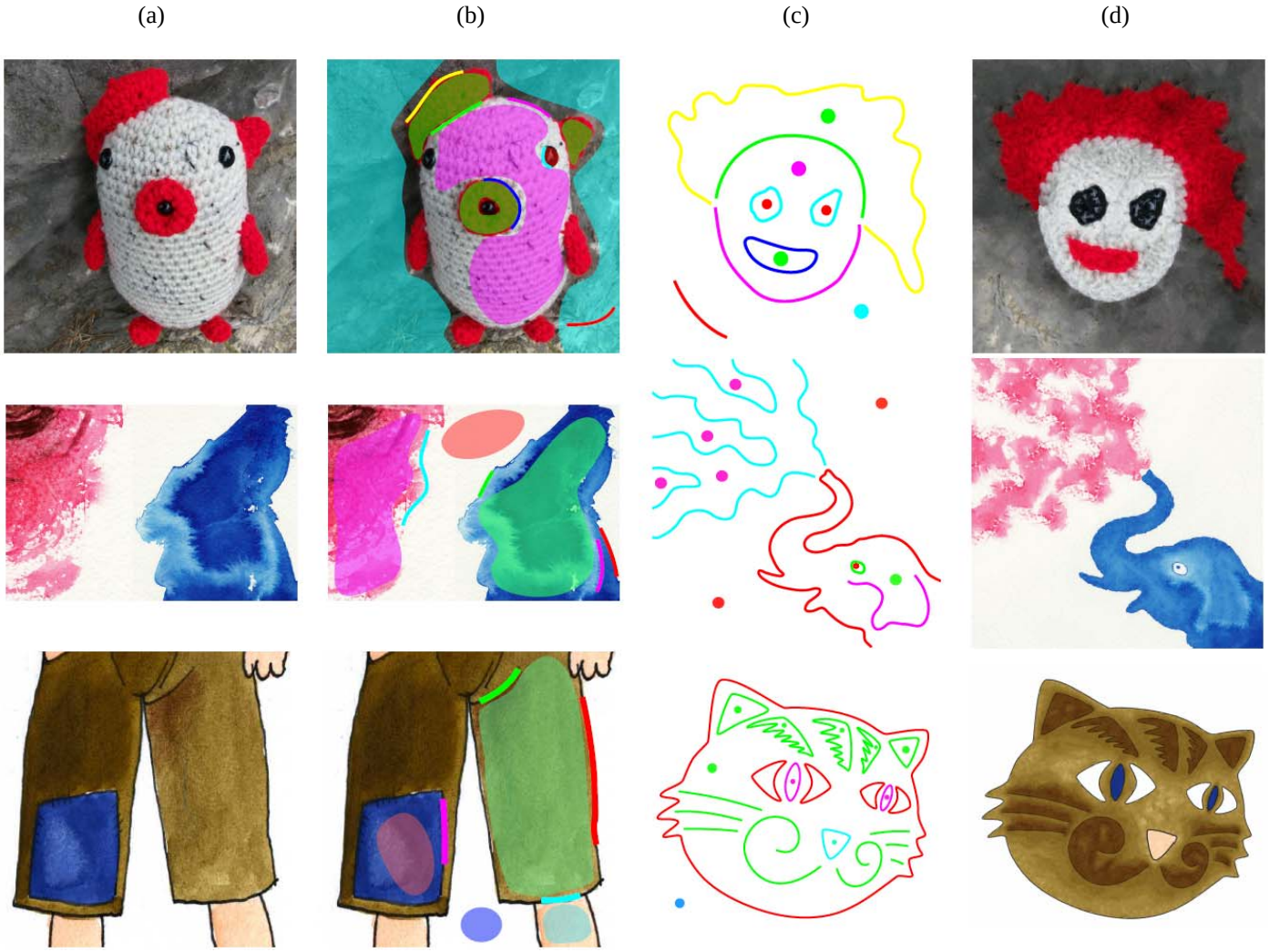

Figure 1: An example of Painting by Feature workflow: selected exemplar image(a) is annotated in order to to select line and areal features (b), these features are transferred into a new drawing (c), and the algorithm then synthesize the final image which preserves local features of the exemplar image while conforming a new high-level structure prescribed by the user (d).

Our research

In our research we aim to reinterpret functionality of classical brush and fill tools found in professional image editing software. We would like to provide an intuitive approach that allows artists to paint in a visual style of arbitrary exemplar images without necessity to perform tedious work of physical painting. Rather than a static library of colors, brushes, or fill patterns, we offer entire images as their palette, from which they can select arbitrary contours or textures as their brush or fill tool in their own creations (see Figure 1). Such a new example-based stylization approach blurs the traditional border between the vector- and pixel-worlds, allowing artists to create and manipulate images while preserving the visual richness of a chosen artistic style. We anticipate the new possibilities in artwork creation that this approach opens to artists.

Applications

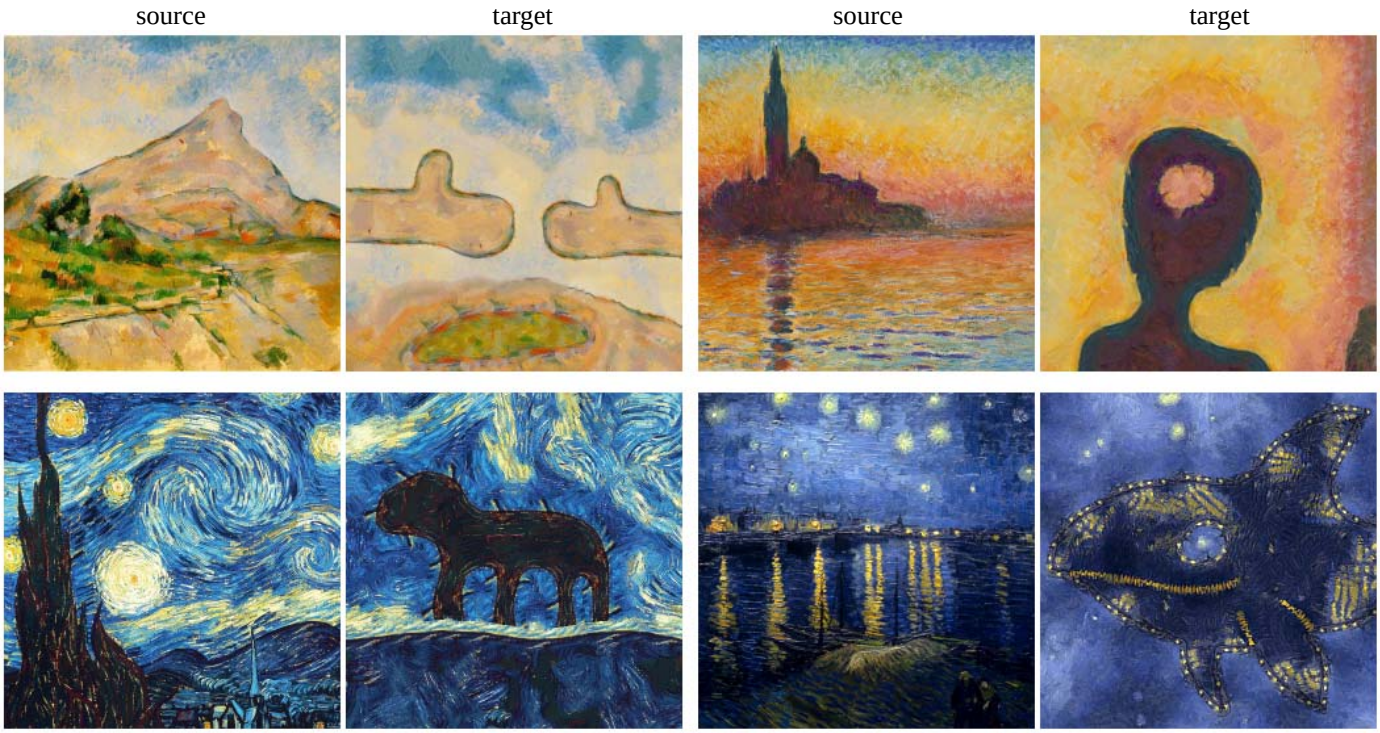

Figure 2: Important line and areal features were selected from photos of Cézanne and Vincent van Gogh's paintings (source), then new structural constraints where specified by the user in order to synthesize a new image (target). Note how the resulting image share the details and overall style of the Cézanne's and van Gogh's paintings while nicely maintains user specified shapes.

One of the primary applications of our method is a generation of new textural information out of limited set of exemplars or vector image stylization where artists select line and areal features and then assigns them to paths and fill shapes of a vector image, respectively (see Figure 1). Another exciting application is interactive example-based painting for users with moderate artistic skills. Here the user may select features from the source exemplars (created, e.g., by famous artists) and then transfer them to manually indicated positions to create and edit paintings interactively with instantaneous feedback (see Figure 2). As the resulting images nicely conveys the original artistic style despite of skills of the user such a process can give the feeling that the user can draw like a famous artist. Further potential applications of our method include image editing scenarios such as in-painting (see inset Figure).

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