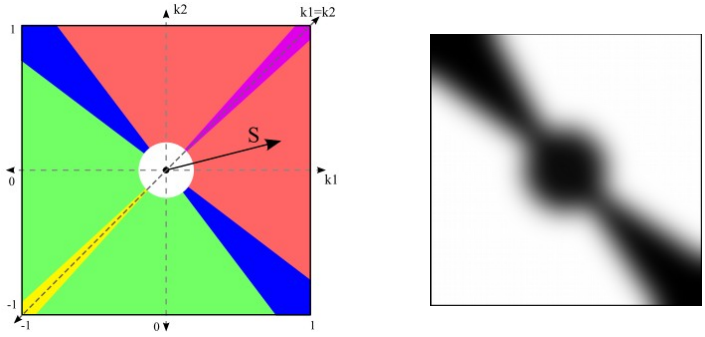
Apparent Relief, is a novel approach to shape depiction in non-photorealistic rendering. The field of shape depicting helps emphasize important characteristics of a shape. It is often applied in the field of scientific visualization.

The technique discussed is a great improvement over other, line-based or shading-based approaches. Typically, line-based technques limit themselves to extrracting contours by the means of tracking discontinuities of shape features on the image plane. Shading-based approaches conventionally involve manipulating light positions to reveal shape features. Such an approach clearly gets computationally expensive and therefore impratical when dealiig with complex geometries. The technique discussed in the paper is also a shading-based technique. The main contribution is a shape descriptor, **Apparent Relief**, a form of a map that allows for shape cues extraction leading to stylized shading-based shape representation. By design, it provides automatic LOD. It is good for online rendering.

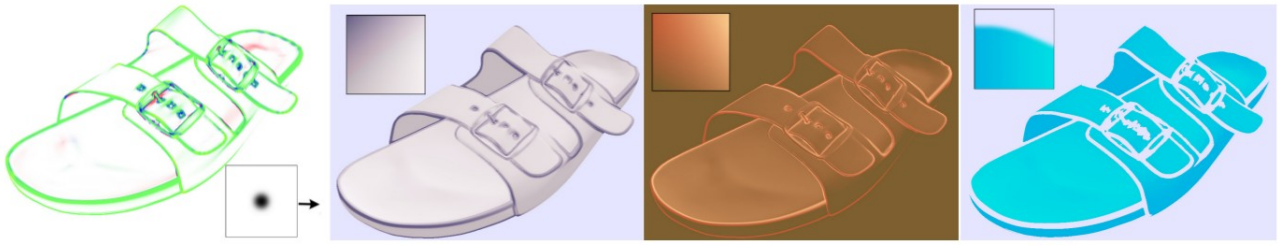
The authors demonstrate the effectiveness of their approach by the means of images. No formal user study or evaluation is performed. The figures illustrate 3D models, resulting shape cues and different shading styles (cel, cartoon, minimal and exaggerated) that benefit from these shape cues. The images are quite convincing of the effectiveness of their approach. It is clear that the shape cues can be used in different ways for stylized rendering.

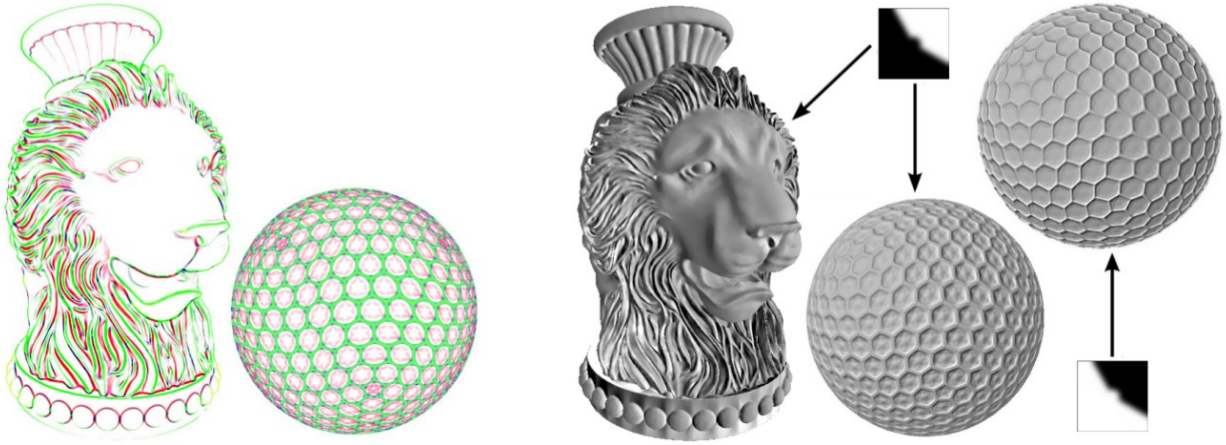
The technique discussed in the paper involves convexity information from object space and curvedness information from image space. Both pieces of imnformation are needed to compute vector **S**, at each pixels, which corresponds to a vector in the shape descriptor domain.



In the object space, curvature tensor is computed (Rusinkiewicz method). It is then interpolated for each pixel. For the image-space stage, surface normals need to be supplied in a texture for sampling. Normal veriations are computed using Gaussian derivative kernels for x and y. These result in directional gradiants that are used to assemble symmetric tensor field (2x2 matrix). The curvedness is given by computing maximum absolute eigenvalue.

The idea presented in the paper seemed not to be of too much interest to me. However, it presents an interesting approach for shape depicting that can be utilized in many ways for stylized rendering. Quite possibly, some tweaking could yield unexpected and usefult results.





References

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