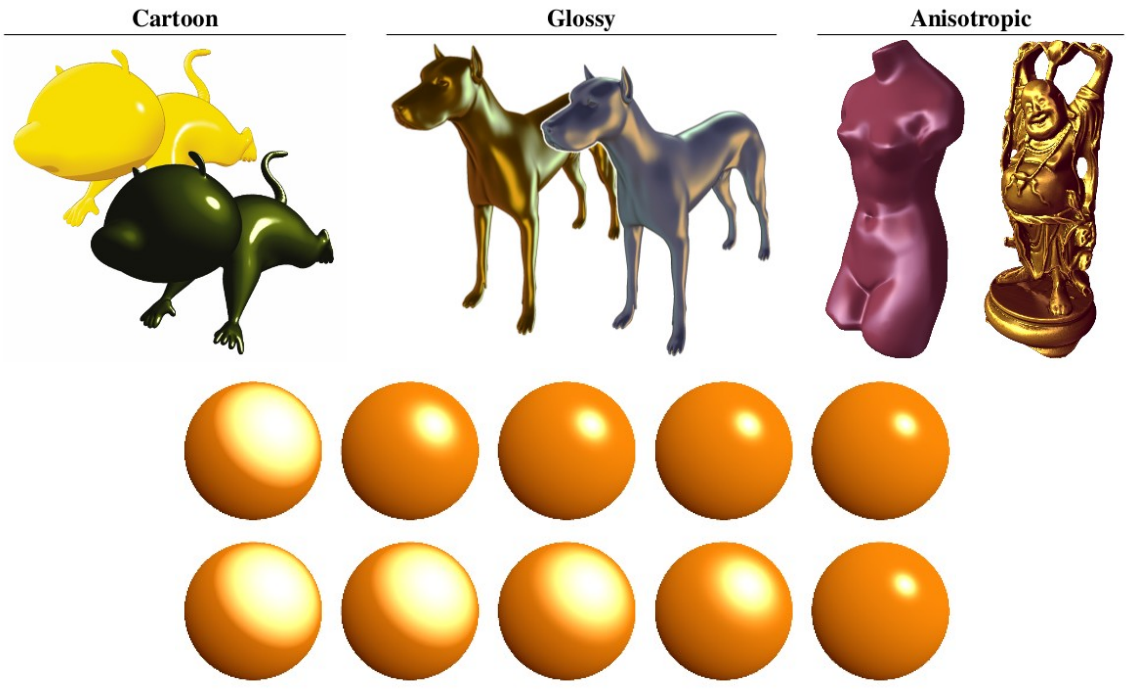
Vanderhaeghe et al. in their work, *Dynamic Stylized Shading Primitives*, present a shading technique of extremely high flexibility allowing for imitating various shading styles, known from different illustratioins, comics or graphic novels. The technique could allow artists to design tweak the shading appearance and dynamic behaviour.

The technique involves combining multiple shading primitives (render targets). Each primitive, as defined by authors, is influenced by several (but small number of) shading parameters. Each primitive's parameters can be subjects to continuous variations, leading to uniform visual changes. Combining (blending) resulting primitives yields various and interesting shading styles. Such approach makes it easier for artists to emphasize different characteristics of the 3D model based on context and ambience.

The approach may initially seem as known, old technique. Conventional techniques often utilize multiple rendering passes involving expensive pipeline state changes (different shader programs). The technique described in this paper utilzes a single shader for each pass (primitive).

Symbol	Domain	Name
$K(\cdot)$	$[0, \pi] \rightarrow [0, 1]^3$	Color
α	$[0, 1]$	specularity
τ	$[-\pi, \pi]$	extent
f	$[0, \pi]$	intensity fall-off
c	$[f, \pi]$	intensity cut-off
λ	$(-1, 1)$	material anisotropy
μ	R	surface enhancement
χ	R	concave/convex transition

The results are illustrated in multiple figures across the paper as well as in two videos accessible from https://vimeo.com/25024611 and https://vimeo.com/25024856.



The paper lacks formal evaluation of the technique. It is left to the reader to decide on the usefullness of the technique. The performance gains resulting from utilizing this technique rather than more conventional methods, however, are obvious.

The authors note that the technique is only capable of producing opaque surface materials. Different techniques need to be utilized to achieve translucency. It is also noted that the technique needs further enhancements to cope with rapidly chaning curvatures in a model geometry.

The method dicussed in this paper is of benefit to all novice graphics programmers. It seems the technique is capable of producing images that feature elegant and realistic shading/lighting while retaining the cartoon feel of the results. It will be interesting to investigate the usefullness of such as technique in my projects.

References

David Vanderhaeghe, Romain Vergne, Pascal Barla, and William Baxter. 2011. Dynamic stylized shading primitives. In *Proceedings of the ACM SIGGRAPH/Eurographics Symposium on Non-Photorealistic Animation and Rendering* (NPAR '11), Stephen N. Spencer (Ed.). ACM, New York, NY, USA, 99-104. DOI=10.1145/2024676.2024693 http://doi.acm.org/10.1145/2024676.2024693