Swung-to-Cylinder Projection for Panoramic Image Viewing

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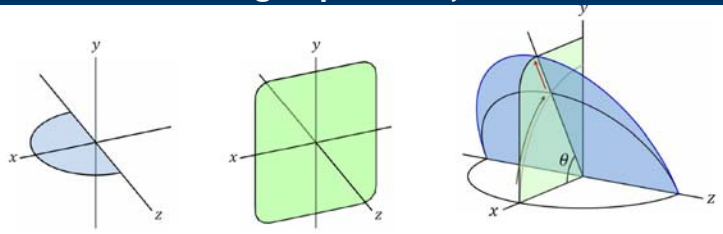
Introduction

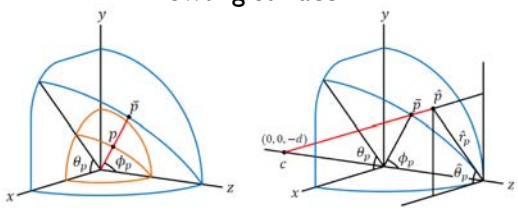
This paper extends the swung-to-plane projection model so that it can work for viewing full 360 spherical panoramas.

Swung-to-plane Projection



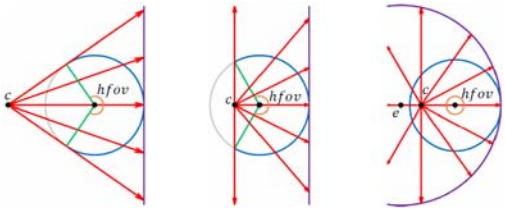
(a) Profile curve (b) Trajectory curve (c) Surface construction

Swung surface



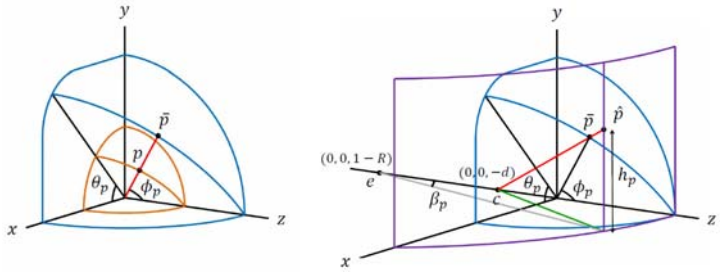
(a) The first step (b) The second step

Swung-to-plane projection



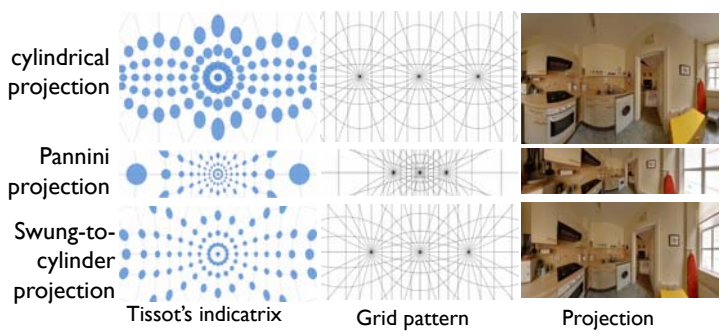
Horizontal FOV analysis

Swung-to-Cylinder Projection



(a) The first step (b) The second step

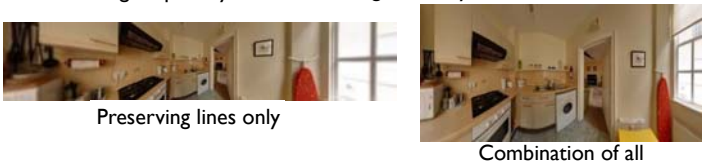
Swung-to-cylinder projection



Distortion analysis

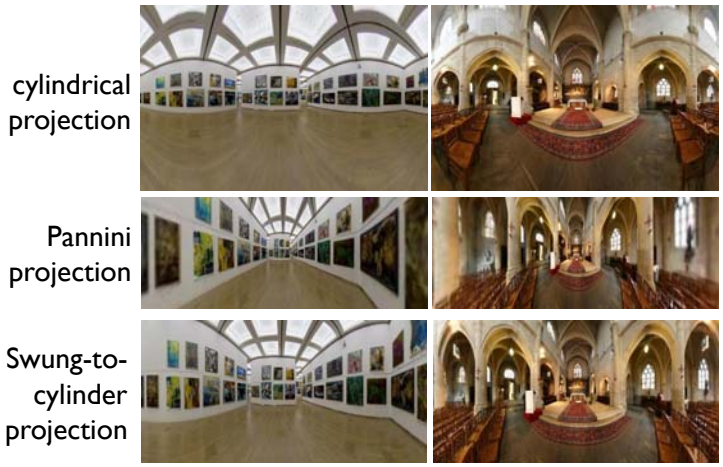
Results

Preserving shape only Preserving area only

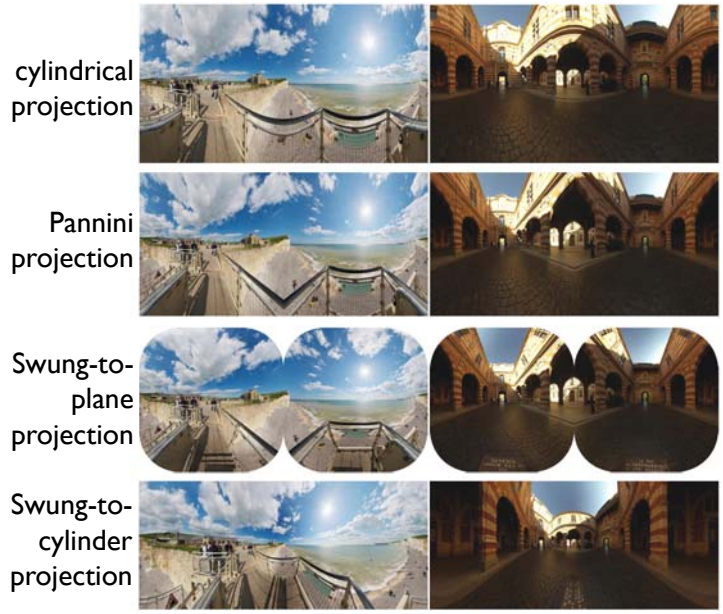


Preserving lines only Combination of all

Parameter optimization.



Comparisons on viewing large hFOV images.



Comparisons on viewing full spherical panoramas.

References

[1] Chang C.-H., Hu M.-C., Cheng W.-H., Chuang Y.-Y.: Rectangling stereographic projection for wide-angle image visualization. In Proceedings of IEEE ICCV 2013, pp. 2824–2831.

[2] Sharpless T. K., Postle B., German D. M.: Pannini: a new projection for rendering wide angle perspective images. In Proceedings of the Sixth international conference on Computational Aesthetics in Graphics, Visualization and Imaging (2010), pp. 9–16.