Eurographics Workshop on Intelligent Cinematography and Editing (2017)
W. Bares, V. Gandhi, Q. Galvane, and R. Ronfard (Editors)

La caméra enchantée

Jarek Rossignac

College of Computing, Georgia Institute of Technology, USA

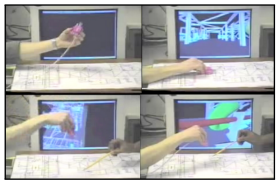

Figure 1: *Minicam moved freely over a floor plan during a collaborative design review.*

Abstract

*A rich set of tools have been developed for designing and animating camera motions. Most of them optimize some geometric measure while satisfying a set of geometric constraints. Others strive to provide an intuitive graphical user interface for manipulating the camera motion or the key poses that control it. We will start by reviewing examples of such tools developed by the speaker and his collaborators and students. These include a 6 DoF GUI for moving a MiniCam over a floor plan of the set, arguing the benefits of Screw Motions for interpolation key poses, using HelBender to smoothen piecewise helical interpolating motions, and controlling the camera by moving on the screen the location of feature points tracked by the camera, and scene graph extensions that support smooth transitions between tracked objects. Then, we will ask harder questions: What is the best way for the user to specify the objectives, the constraints, and the camera motion style? How do we define and program such a style? Is the objective to make the motion so natural that it is not noticed by the viewer or is should we strive to support aesthetic qualities and artistic camera actions? And finally, how do we define and program responsive camera behaviors for interactive environments? Author's prior publications referenced in the talk include: [SBM*95], [RK01], [KR03], [PR05], [RKS*07], [PR08], [RS08], [RV11], [RK12], [RLV12].*

Categories and Subject Descriptors (according to ACM CCS): I.3.7 [Computer Graphics]: Three-Dimensional Graphics and Realism—Animation, I.4.1 [Image Processing and Computer Vision]: I.4.8 Scene Analysis—Motion

References

[KR03] KIM B., ROSSIGNAC J.: Collision prediction for polyhedra under screw motions. In *Proceedings of the eighth ACM symposium on Solid modeling and applications* (2003), ACM, pp. 4–10. 1

[PR05] POWELL A., ROSSIGNAC J.: *ScrewBender: Polyscrew Subdivision for Smoothing Interpolating Motions*. Tech. rep., GVU Technical Report GIT-GVU-05-05, 2005. 1

[PR08] POWELL A., ROSSIGNAC J.: Screwbender: Smoothing piecewise helical motions. *Computer Graphics and Applications, IEEE 28*, 1 (2008), 56–63. 1

[RK01] ROSSIGNAC J., KIM J. J.: Computing and visualizing pose-interpolating 3d motions. *Computer-Aided Design 33*, 4 (2001), 279–291. 1

[RK12] ROSSIGNAC J., KIM J. J.: Helsweeper: Screw-sweeps of canal surfaces. *Computer-Aided Design 44*, 2 (2012), 113–122. 1

[RKS*07] ROSSIGNAC J., KIM J. J., SONG S., SUH K., JOUNG C.: Boundary of the volume swept by a free-form solid in screw motion. *Computer-Aided Design 39*, 9 (2007), 745–755. 1

[RLV12] ROSSIGNAC J., LUFFEL M., VINACUA À.: Samba: Steadied choreographies. In *Proceedings of the Eighth Annual Symposium on Computational Aesthetics in Graphics, Visualization, and Imaging* (2012), Eurographics Association, pp. 1–9. 1

[RS08] ROSSIGNAC J., SCHAEFER S.: J-splines. *Computer-Aided Design 40*, 10 (2008), 1024–1032. 1

[RV11] ROSSIGNAC J., VINACUA Á.: Steady affine motions and morphs. *ACM Transactions on Graphics (TOG) 30*, 5 (2011), 116. 1

[SBM*95] SCHNEIDER B.-O., BORREL P., MENON J., MITTLEMAN J., ROSSIGNAC J.: Brush as a walkthrough system for architectural models. In *Photorealistic Rendering Techniques*. Springer Berlin Heidelberg, 1995, pp. 401–409. 1

DOI: 10.2312/wiced.20171064