

SIBGRAPI '16

XXIX CONFERENCE ON GRAPHICS, PATTERNS AND IMAGES



UFRJ

Hybrid animation with spatial keyframes and motion capture

Bernardo F Costa, Claudio Esperança

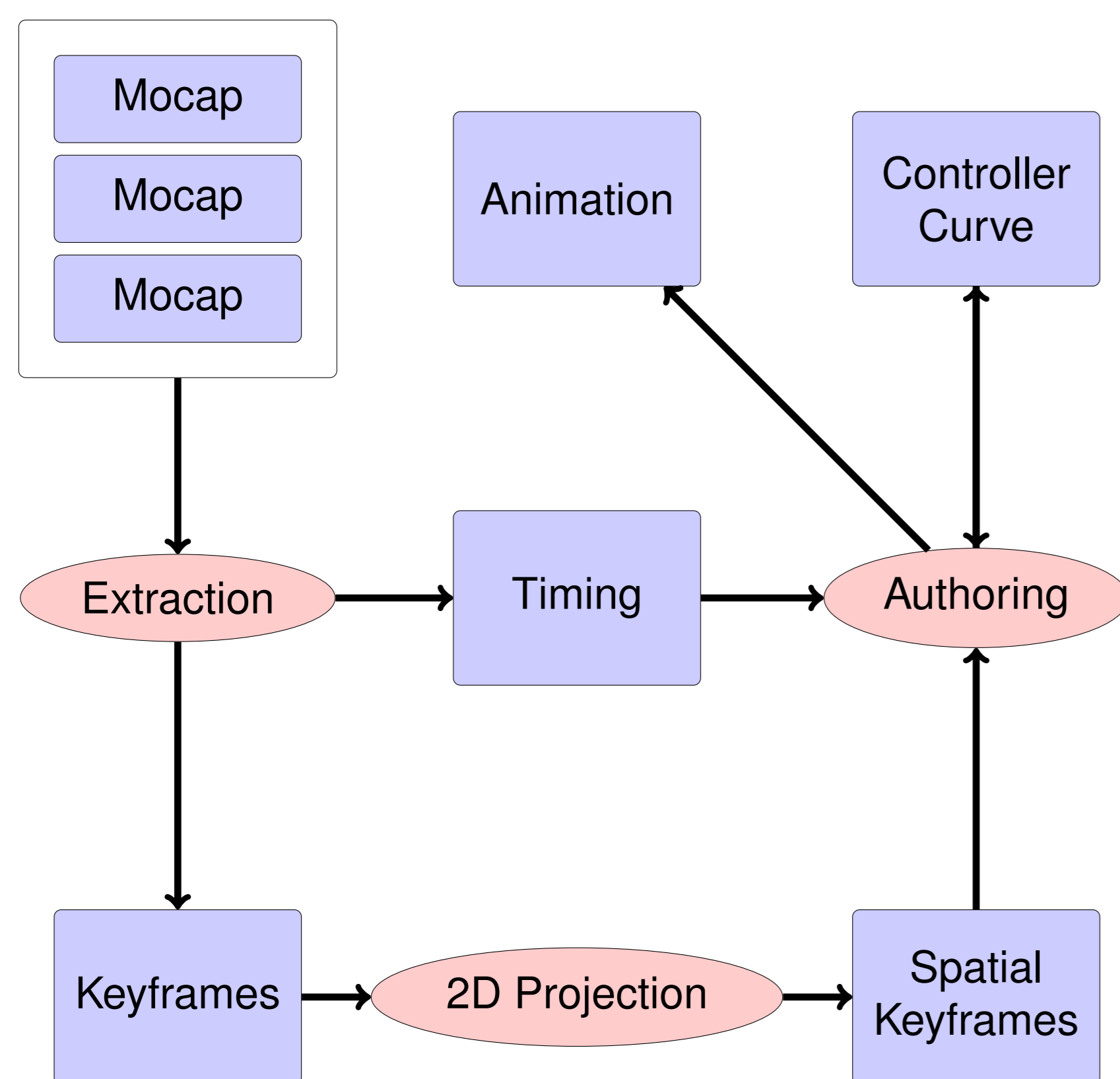
LCG / PESCS / COPPE / UFRJ

{bfcosta,esperanc}@cos.ufrj.br



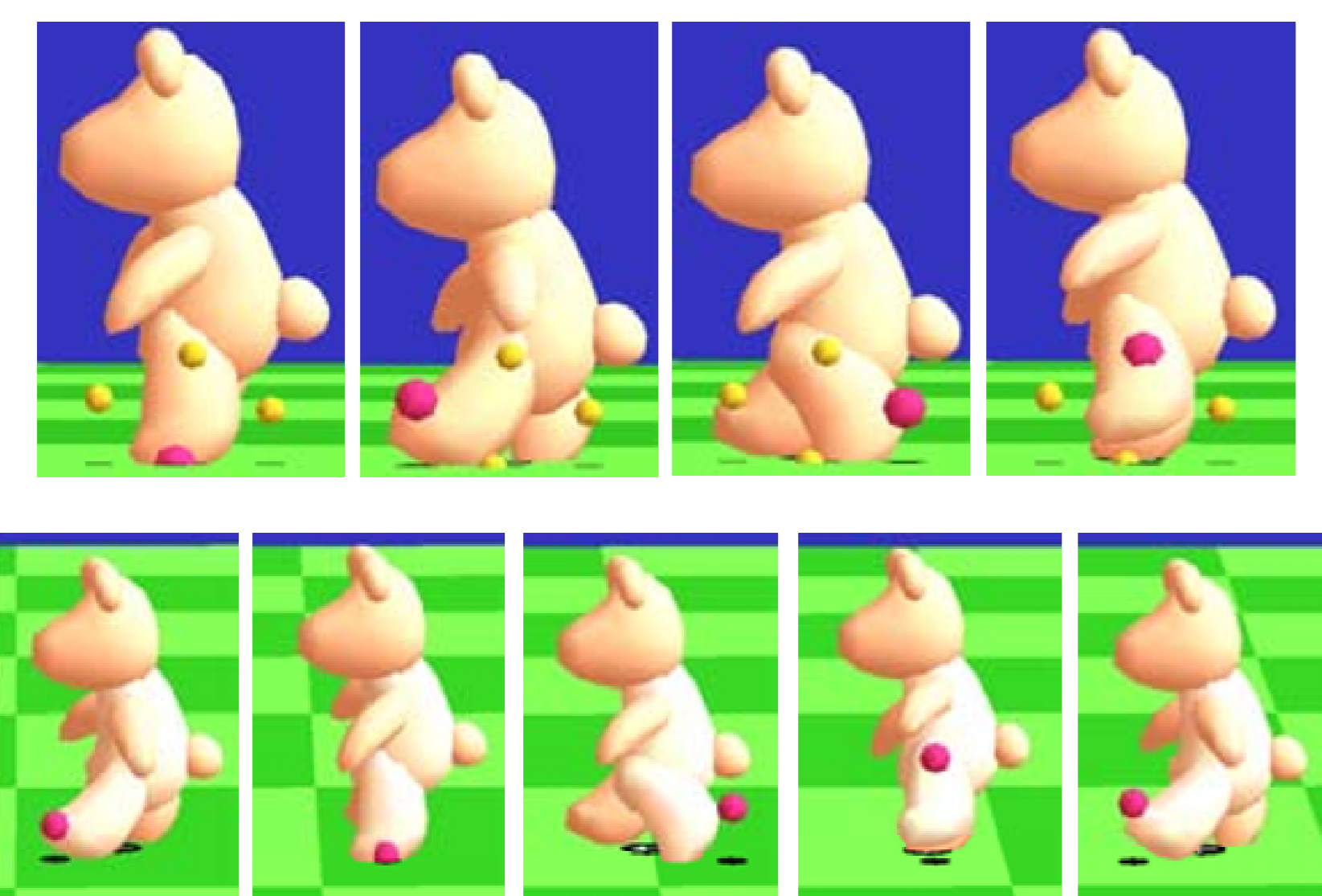
Programa de Engenharia de Sistemas e Computação

1. Basic Idea



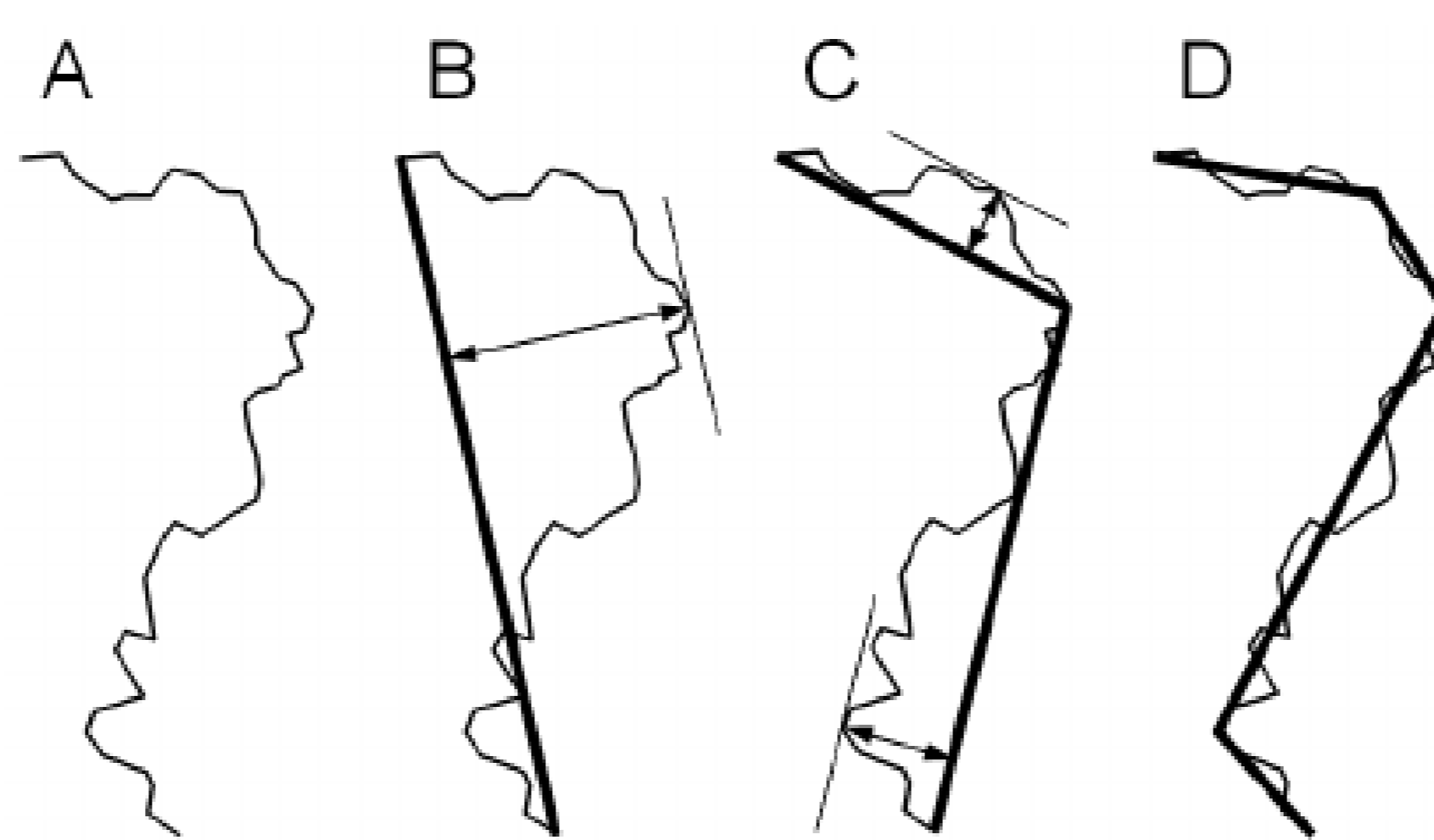
Basic animation scheme. Animator can build animations with motion capture data and newly created poses with spatial keyframe. Motion capture provides realism and spatial keyframe flexibility.

2. Spatial Keyframe



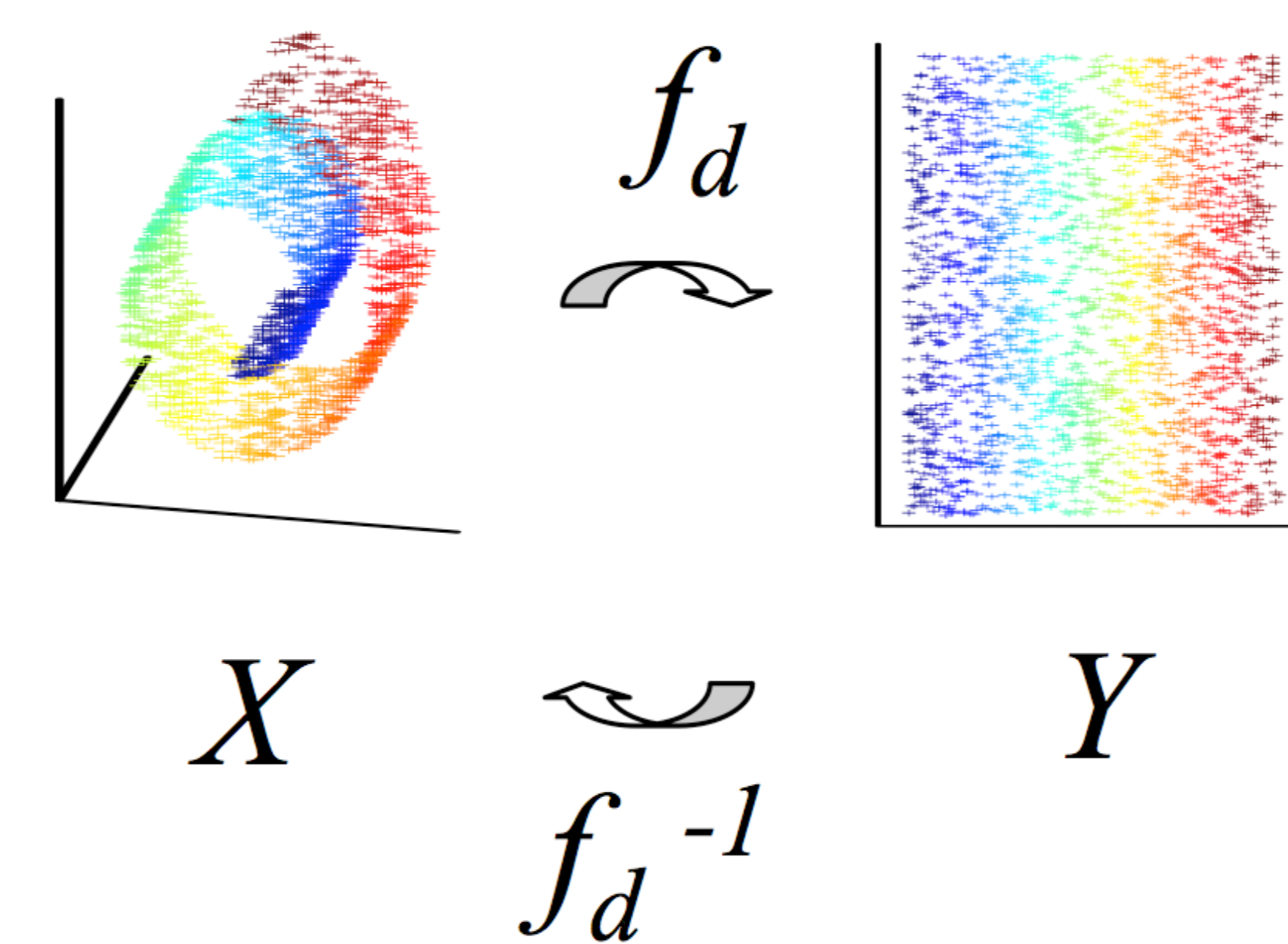
Spatial Keyframe[1] animation scheme. Recorded character poses are associated to markers (yellow spheres). A controller (red sphere) blends poses in real time.

3. Extracting Keyframes



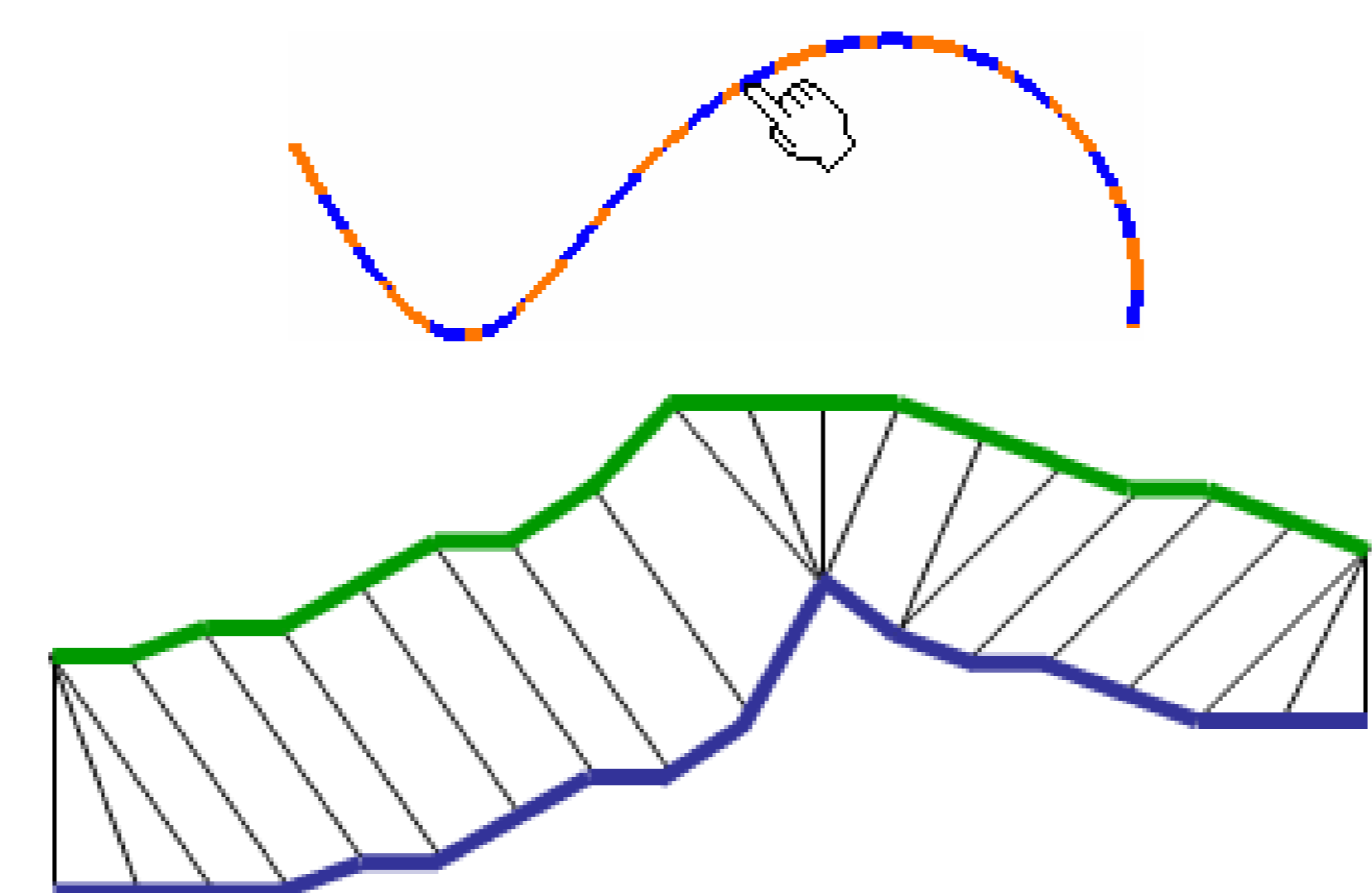
Simple curve simplification (SCS) [2] scheme iteratively adds points to interpolation set, searching for the greatest distance between interpolated and real curve.

4. Place Markers on 2D



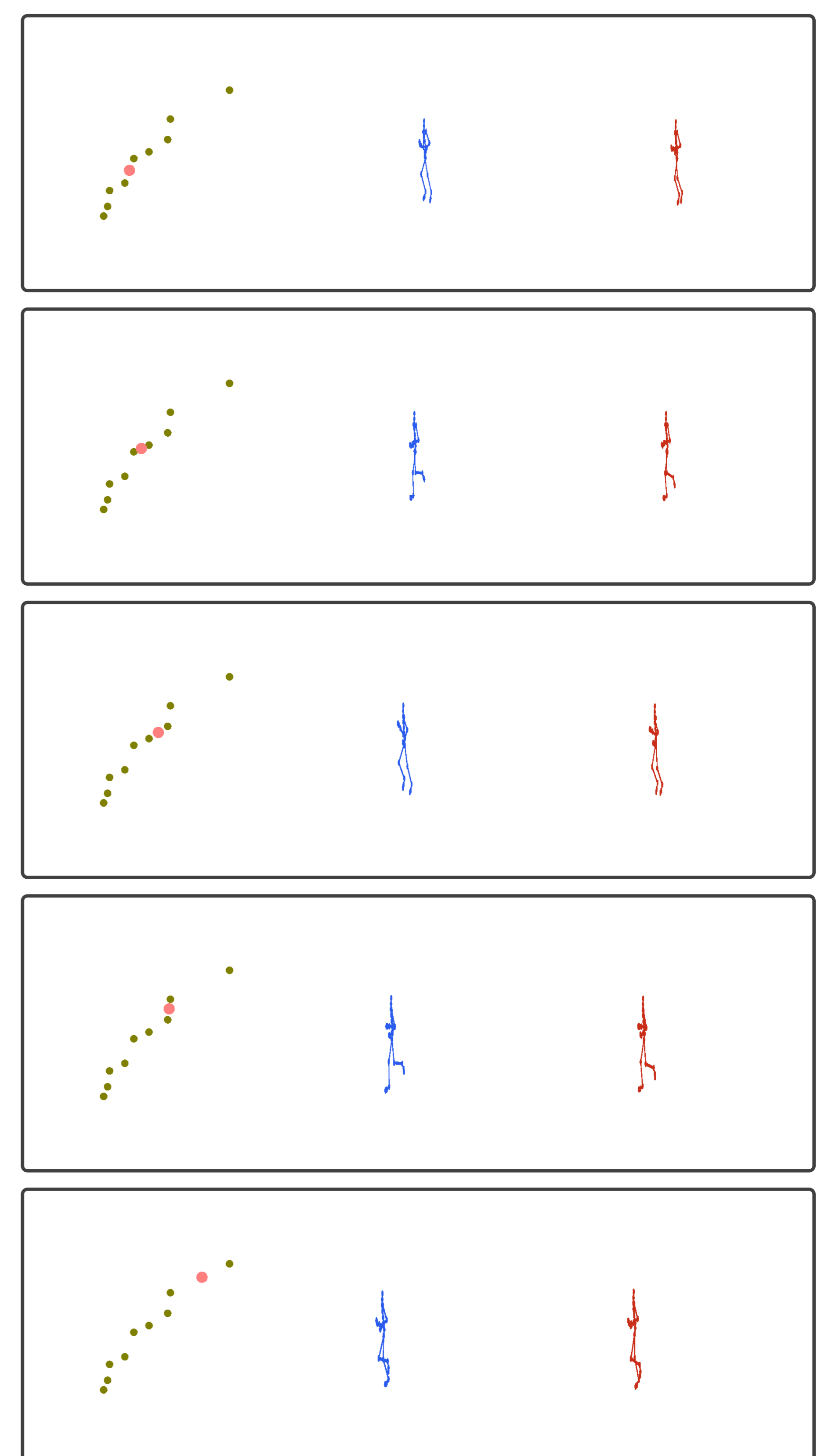
Multidimensional reduction techniques for projecting poses onto 2D screen space have to be considered. LAMP[3] approach seems attractive.

5. Curve Editing



Controller curves can be edited. Mocap database can provide time alignment for greater realism.

6. Current status



Current status. Keyframes are extracted with SCS and markers are spread by force approach[4]. Blue skeleton is mocap and red skeleton is interpolation. Markers and controller are on the left side.

References

- [1] T. Igarashi, T. Moscovich, and J. F. Hughes, "Spatial keyframing for performance-driven animation," in *Proceedings of the 2005 ACM SIGGRAPH/Eurographics Symposium on Computer Animation*, ser. SCA '05. New York, NY, USA: ACM, 2005, pp. 107–115. [Online]. Available: <http://doi.acm.org/10.1145/1073368.1073383>
- [2] I. S. Lim and D. Thalmann, "Key-posture extraction out of human motion data," in *Engineering in Medicine and Biology Society, 2001. Proceedings of the 23rd Annual International Conference of the IEEE*, vol. 2. IEEE, 2001, pp. 1167–1169.
- [3] P. Joia, F. Paulovich, D. Coimbra, J. Cuminato, and L. Nonato, "Local affine multidimensional projection," *Visualization and Computer Graphics, IEEE Transactions on*, vol. 17, no. 12, pp. 2563–2571, Dec 2011.
- [4] E. Tejada, R. Minghim, and L. G. Nonato, "On improved projection techniques to support visual exploration of multidimensional data sets," *Information Visualization*, vol. 2, no. 4, pp. 218–231, Dec. 2003. [Online]. Available: <http://dx.doi.org/10.1057/palgrave.ivs.9500054>