Temporally coherent points for non-photorealistic rendering

(a)

(b)

(c)

Description:

The main objective is to implement a stroke-based rendering system with the main characteristic to deal efficiently with three conflicting constraints: the distribution of points should retain a good repartition in 2D; their motion should tightly follow the target motion in the underlying scene; and as few points as possible should be added or deleted from frame to frame. The input is a 3D scene or video and creates non-uniform distributions with good temporal coherence and density properties. Unlike the base paper [1], we would like to keep a constraint on the point density (the number of points should always be the same).

This project will be a starting point for a new research project. So, the students who find it attractive and are motivated to work further will have an opportunity to participate in a cool small research project.

Implementation difficulty: Easy to Moderate
Prerequisite: Good programming skills (preferably in C++)

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References:

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[2] Hertzmann A., "A survey of stroke-based rendering", IEEE Computer Graphics and Applications 2003
[3] Meruvia Pastor, Oscar E. and Strothotte, Thomas, "Frame-Coherent Stippling", EG02 SP
[4] John Bowers, Rui Wang, Li-Yi Wei, David Maletz, "Parallel Poisson Disk Sampling with Spectrum Analysis on Surfaces", ACM ToG 2010
[5] Fernando de Goes, Katherine Breeden, Victor Ostromoukhov, Mathieu Desbrun, "Blue Noise through Optimal Transport", ACM ToG 2012
[6] Pierre Benard et al., "Self-Similar Texture for Coherent Line Stylization", NPAR'10
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