SIGGRAPH 2016 : retours sur le futur

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   - SIGGRAPH 2016
   - VR Village, Art..
   - Wow time
2. Caroline - Tech papers
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   - Procedural Voronoi Foams for Additive Manufacturing
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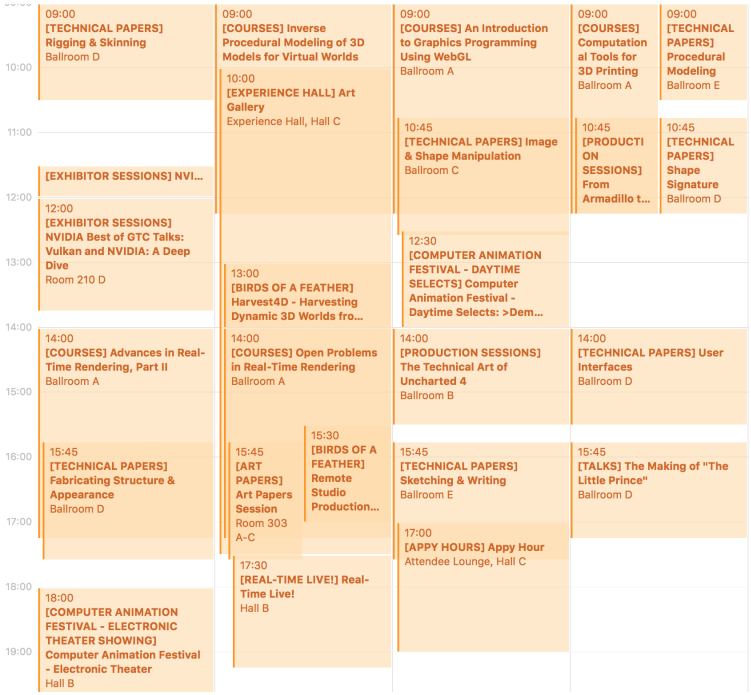
SIGGRAPH 2016 (Anaheim)

- 14 000 attendees / 153 exhibitors
- Technical Papers :
  Submitted: 467, Accepted: 119,
  Acceptance Rate: 25% (sources: kesen)
- 4 sessions in parallel
- Lots of extras: BoFs, Wow demos...
- Co-located events : Web3D 2016



VR Village

Reality and Virtual Reality Basketball demo by OptiTrack @ Siggraph 2016

https://www.youtube.com/watch?v=iqZhzkM_HNg

VR Village

VR Mech Simulator

https://www.youtube.com/watch?v=HDn_oNPlKrc

Art

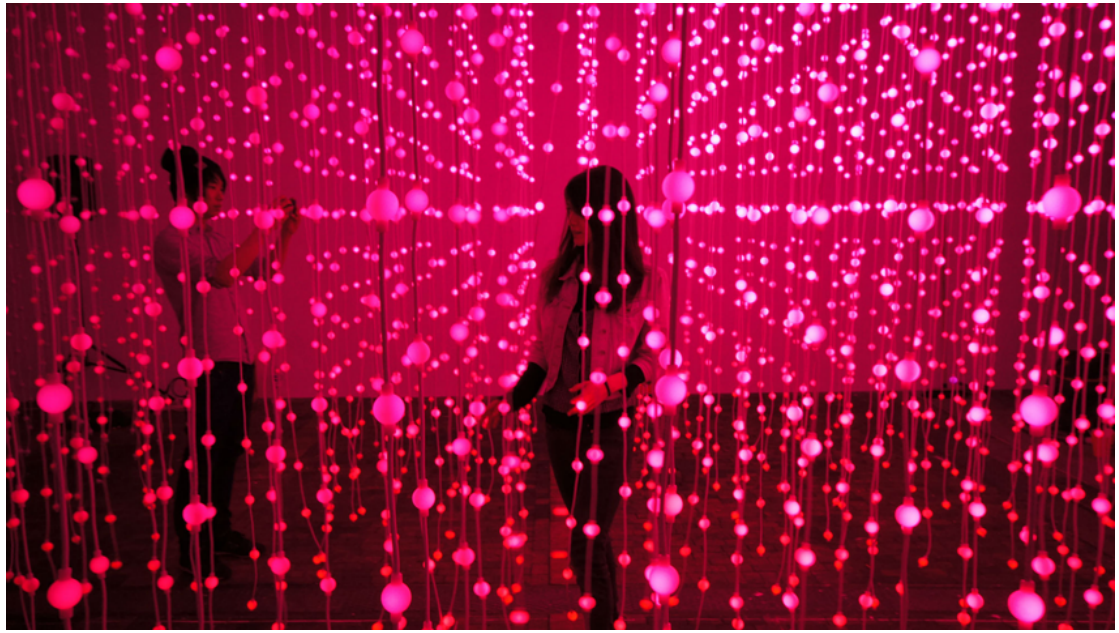


Figure: photo credit: Submergence, Anthony Rowe, Gaz Bushell, Liam Birtles, Chris Bennewith, Oliver Brown Squidsoup

Computer animation festival

BEST Borrowed Time (USA)

JURY Cosmos Laundromat (Netherlands)

STUDENT Crabe-Phare (France)

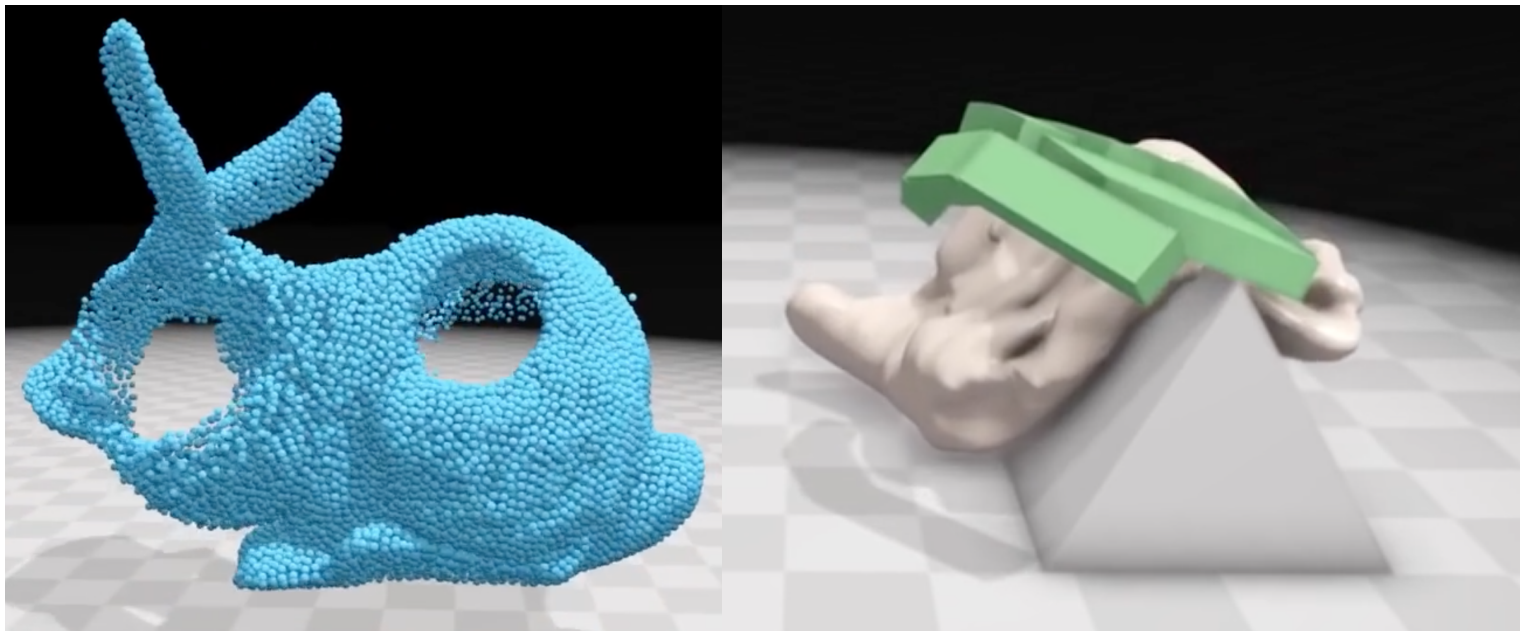
Real-time live

From Previs to Final in Five Minutes: A Breakthrough in Live Performance Capture

https://www.youtube.com/watch?v=JbQSpfWUs4I

Real-time live

Real-Time Simulation of Solids With Large Viscoplastic Deformation



https://www.youtube.com/watch?v=m7js12tGFVA

cSculpt: A System for Collaborative Sculpting

cSculpt: A System for Collaborative Sculpting [Calabrese et al., 2016]

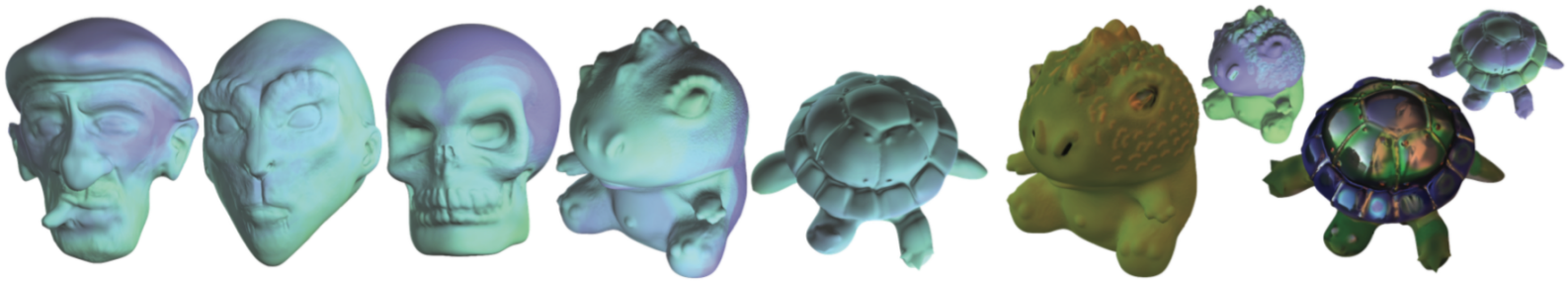


Figure 1: *Left: Models created by two artists sculpting collaboratively starting from a sphere. Right: Collaborative edits to geometry and materials. Colors on the left side and insets encode the total percentage of edits performed by each user: green for user A, blue for user B, and cyan for both.*

`https://www.youtube.com/watch?v=H--1zSkarhk`

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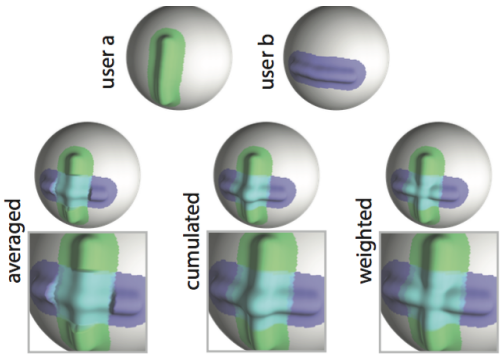
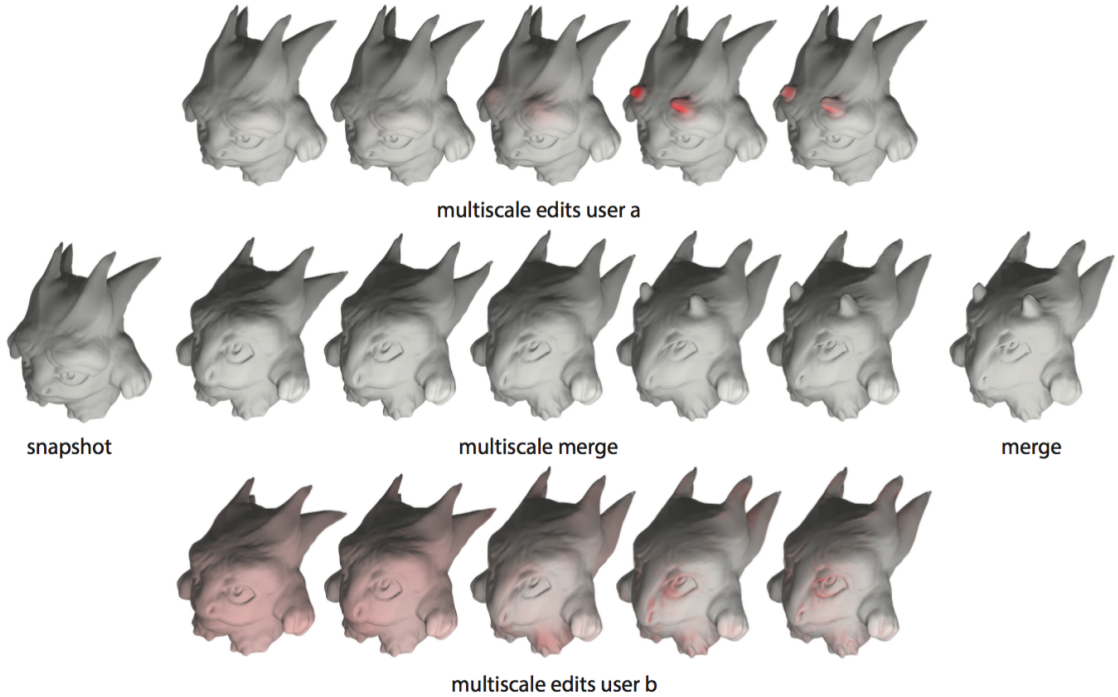
- Result: less conflict == smoother collaboration
- Limitation: connectivity updates, scale invariance

cSculpt: A System for Collaborative Sculpting

Per-vertex combination for merging multiscale edits





Procedural Voronoi Foams for Additive Manufacturing

Procedural Voronoi Foams for Additive Manufacturing [Martínez et al., 2016]

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- Inspiration from procedural noise = infinite contente generated at low cost memory and control statisticlal properties.

Procedural Voronoi Foams for Additive Manufacturing

- Contribution
  - definition of procedural Voronoi foams that can be evaluated very efficiently, have precisely controlled isotropic elastic behavior, and can be spatially graded to produce gradients of elasticity
  - methodology to derive an inverse mapping, from a target elasticity to the parameters driving the microstructure generation.
  - implementation and applications

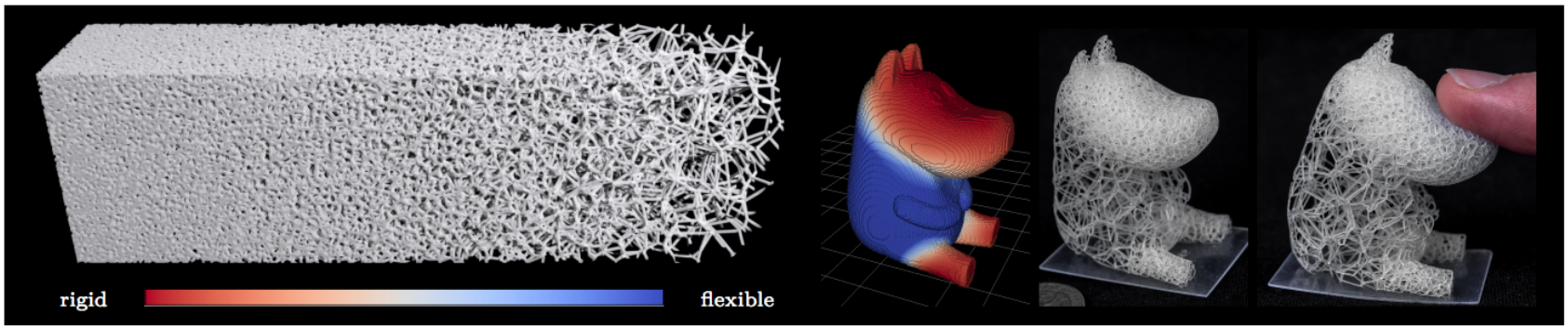


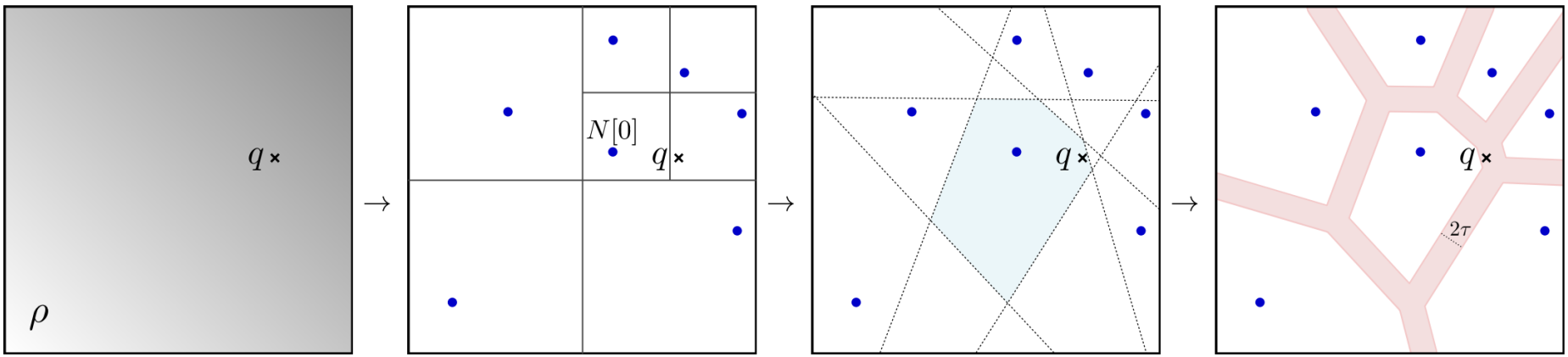
Figure 1: *Our method procedurally generates structures with graded material elasticities, which can be directly fabricated. Here the user paints elasticity on a 3D model to create a flexible figurine.* *Model: Moomin (thing:1173447) by Jeroentjj.*

https://www.youtube.com/watch?v=ENksVUYBrGs

Procedural Voronoi Foams for Additive Manufacturing

Procedural voronoi foams generation algorithm, 2 params :

- the density ρ of Voronoi seeds per unit volume (seeds/mm3),
- the radius τ of the beams along the edges (mm).



(a) *Density field.* **(b)** *Gather seeds.* **(c)** *Evaluate structure.* **(d)** *Voronoi edge beams.*

Figure 2: *2D overview of Algorithm 1. (a) Input query point q and density field ρ. (b) The seeds that could contribute to the Voronoi cell of N[0] (which is the seed closest to q) are gathered (Algorithm 2). (c) The bisectors of the seed pairs influencing q are computed. (d) Finally, the algorithm checks whether q lies inside a beam of radius τ along the Voronoi edge.*

SemanticPaint: Interactive Segmentation and Learning of 3D World

SemanticPaint: Interactive Segmentation and Learning of 3D World [Valentin et al., 2015]

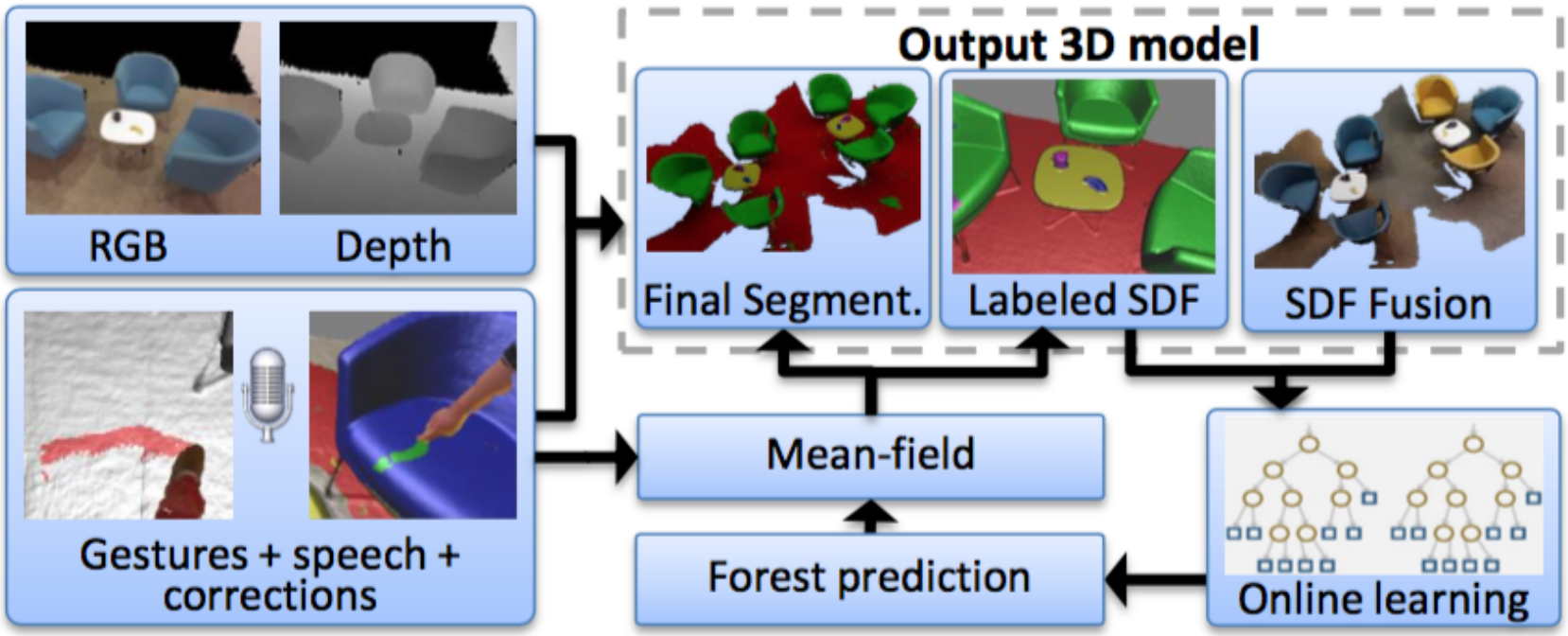


Fig. 3. Overview of 3D semantic modeling pipeline. See text for details.

SemanticPaint: Interactive Segmentation and Learning of 3D World

- 3D semantic modeling system
- User in the loop → online learning
- 2 modes: training and test

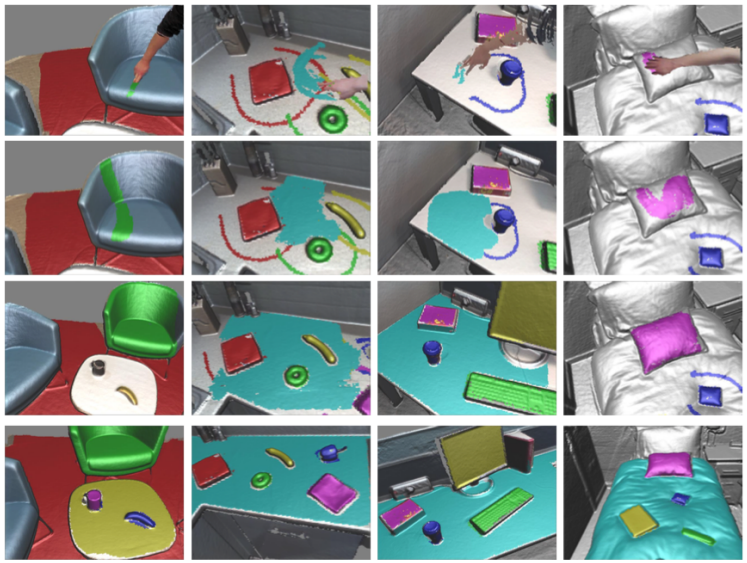


Fig. 6. Label propagation. Our efficient inference engine smoothly propagates class labels from the voxels touched by the user to the rest of the volume. Here we show examples taken from three environments of the coarse user labels (top row) and three time steps (middle three rows) as the mean-field updates are applied over time. The pairwise terms in our energy encourage a smooth segmentation that respects object boundaries. The last row shows the final label propagation results for all hand-labeled objects.

Paper References


Calabrese, C., Salvati, G., Tarini, M., and Pellacini, F. (2016).
csculpt: A system for collaborative sculpting.
ACM Trans. Graph., 35(4):91:1–91:8.


Martínez, J., Dumas, J., and Lefebvre, S. (2016).
Procedural voronoi foams for additive manufacturing.
ACM Trans. Graph., 35(4):44:1–44:12.


Valentin, J., Vineet, V., Cheng, M.-M., Kim, D., Shotton, J., Kohli, P., Nie, M., Criminisi, A., Izadi, S., and Torr, P. (2015).
Semanticpaint: Interactive segmentation and learning of 3d world.
In *ACM SIGGRAPH 2015 Talks*, SIGGRAPH '15, pages 75:1–75:1, New York, NY, USA. ACM.

Ressources

- SIGGRAPH16 Papers: `http://kesen.realtimerendering.com/sig2016.html`
- Real-time live: `http://blog.siggraph.org/2016/07/real-time-wow.html/`
- Exhibitions: `https://www.rocketstock.com/blog/highlights-from-siggraph-2016/`
- Khronos events and videos: `https://www.khronos.org/news/events/2016-siggraph`
- nvidia: `http://www.nvidia.com/object/siggraph2016.html`