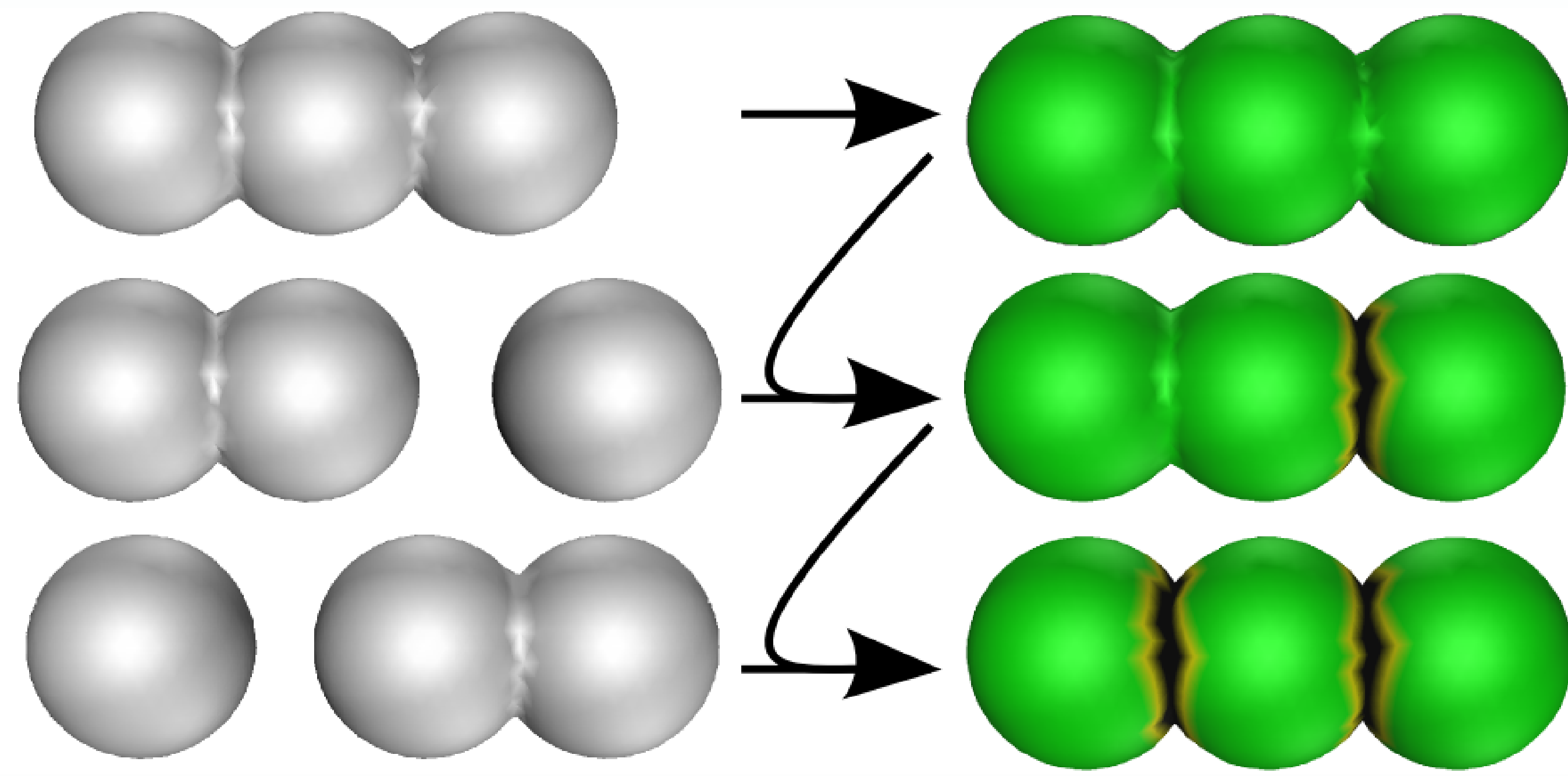
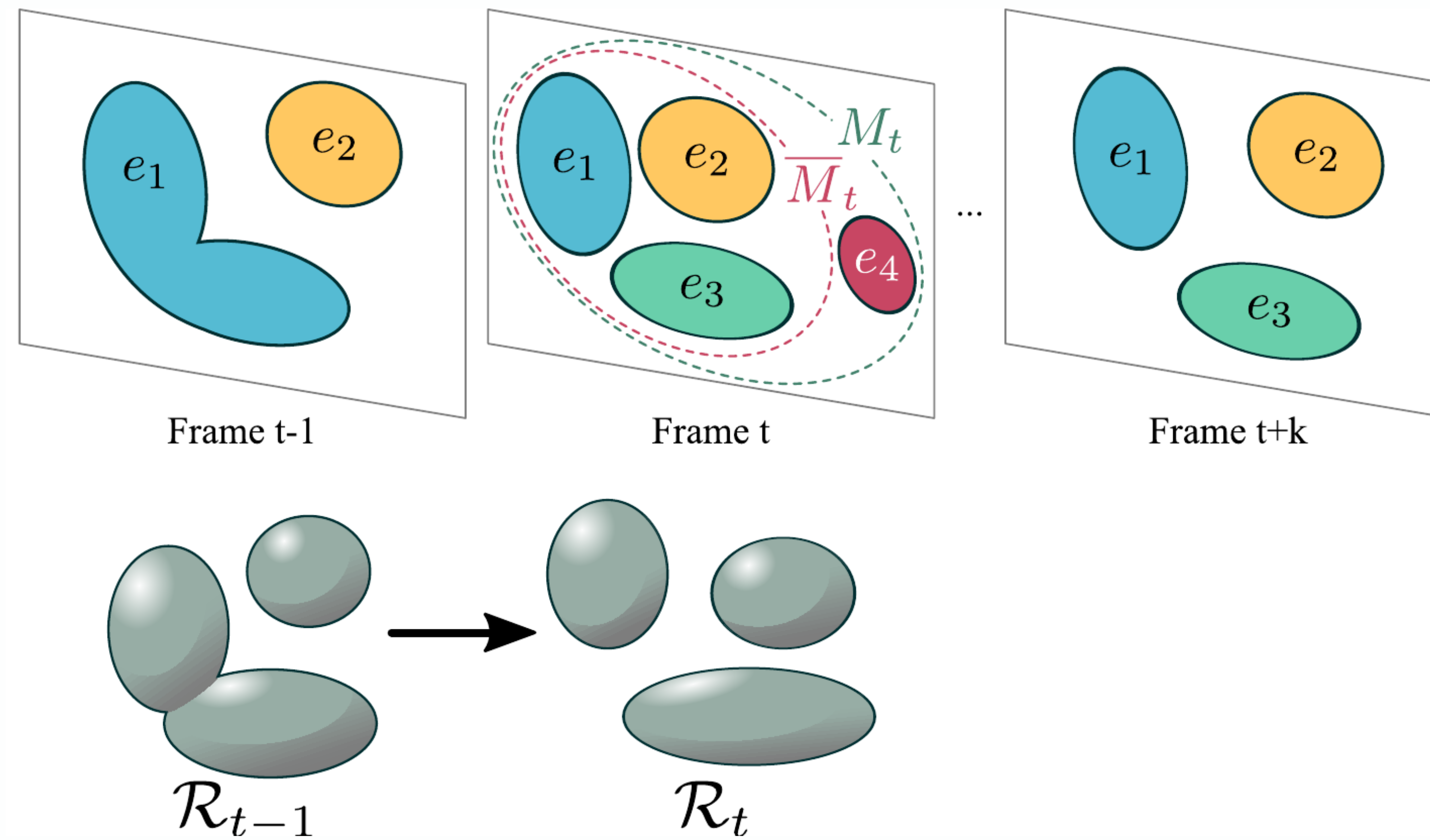


## Context



## Strategy



## Results

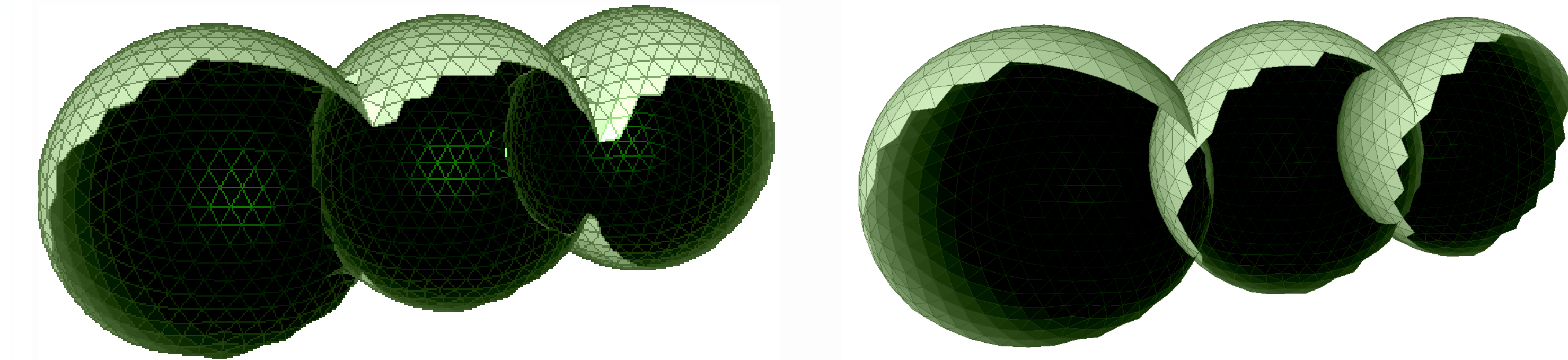


Figure: Comparison between the first and the final model aligned.

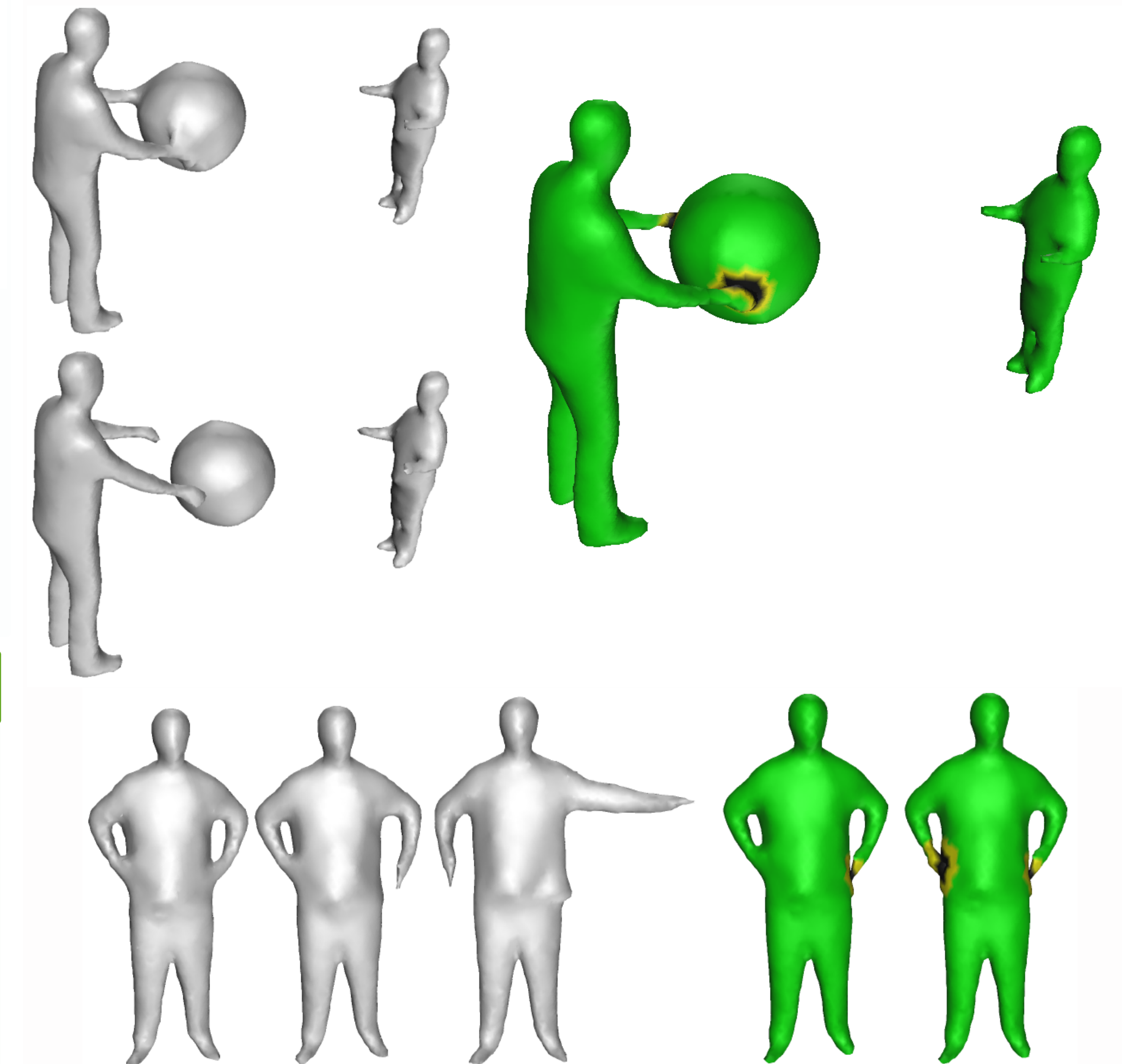
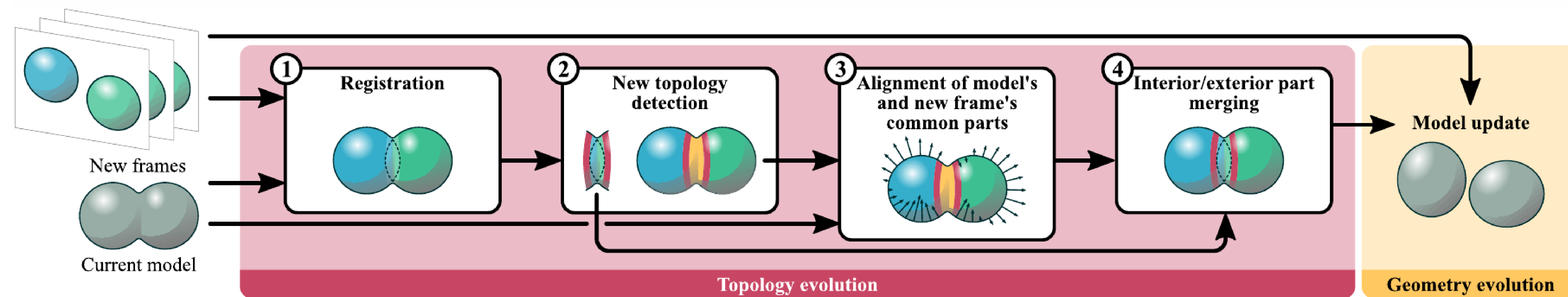


Figure: Left: input sequence with scene topology changes. Right: learned topology.

- Goal:** Incrementally build 3D models from incomplete observations.
- Inputs:** A temporal sequence of incoherent meshes with different connectivity and/or different number of connected components, *e.g.* independent reconstructions.
- Output:** A **coherent model** that includes all the topology information observable in the sequence.

- Hypothesis**  
We assume that objects of the scene cannot merge. Hence every split that is observed in the input data is an evidence of a real split in the scene. Thus this can be accounted for in the progressive model. To limit noise effects, a split must be observed in  $n \geq k$  consecutive frames.

## Approach



- Model registration:** the new frame is registered onto the current progressive model via patch-based surface tracking.
- Topology change detection:** topology changes are detected when self-intersections of the registered frame occur. The resulting inside facets are considered as missing parts in the model.
- Surface alignment:** of the outside part of the new frame onto the current model via surface evolution. This step is needed to keep all the previously gathered topology informations.
- Progressive shape model update:** the new topology information is added to the model and the algorithm proceeds to the next frame.

	average distance to input	average distance to ground truth
Spheres	0.003410	0.003194
Surrey - Flashkick	0.000680	none
INRIA - man, kid & ball	0.000537	none
INRIA - man	0.000550	none

Table: Average Hausdroff distances between progressive models and input data, as well as ground truth when available, normalized by the diagonal of the bounding box.