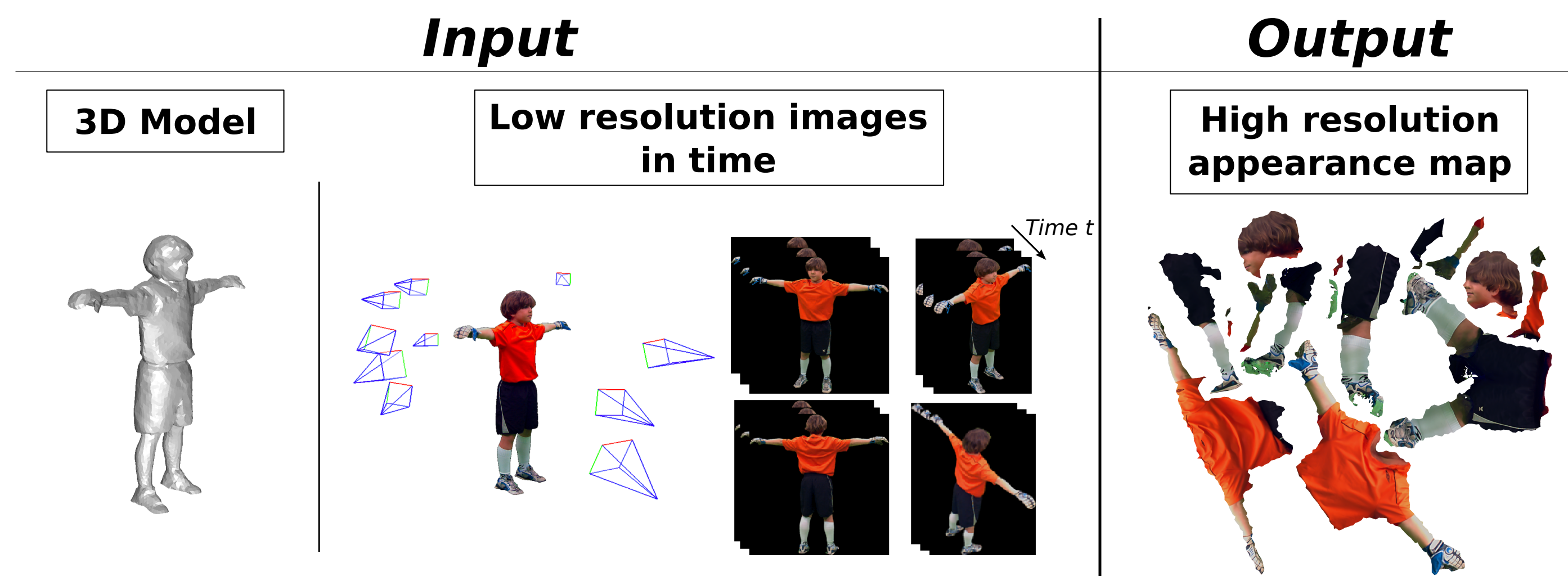


## Objective

Generate a single appearance model that exploits appearance information redundancy over space (multi-view) and time (video sequences).

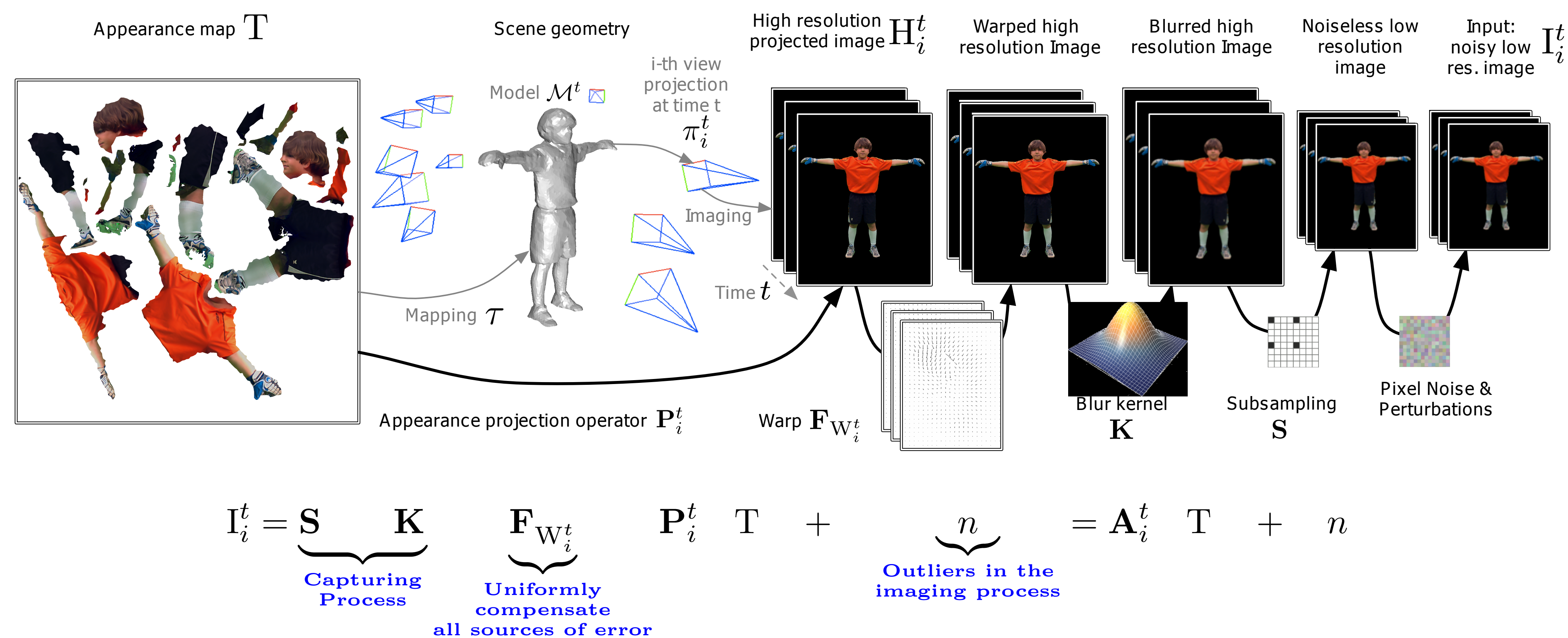


## Contributions

- First approach to generalize 2D linear Bayesian Super-resolution framework to multi-view scenario [1].
- Ability to handle uniformly all sources of error, calibration, reconstruction, temporal misalignments and ghosting through the per-view and per-time frame registration [2].
- To the best of our knowledge, the first approach to deal both with multiple viewpoints and temporal frames to build one common super-resolved texture [3].

## Generative Image Formation Model

We propose a **linear** model to simulate the imaging process.

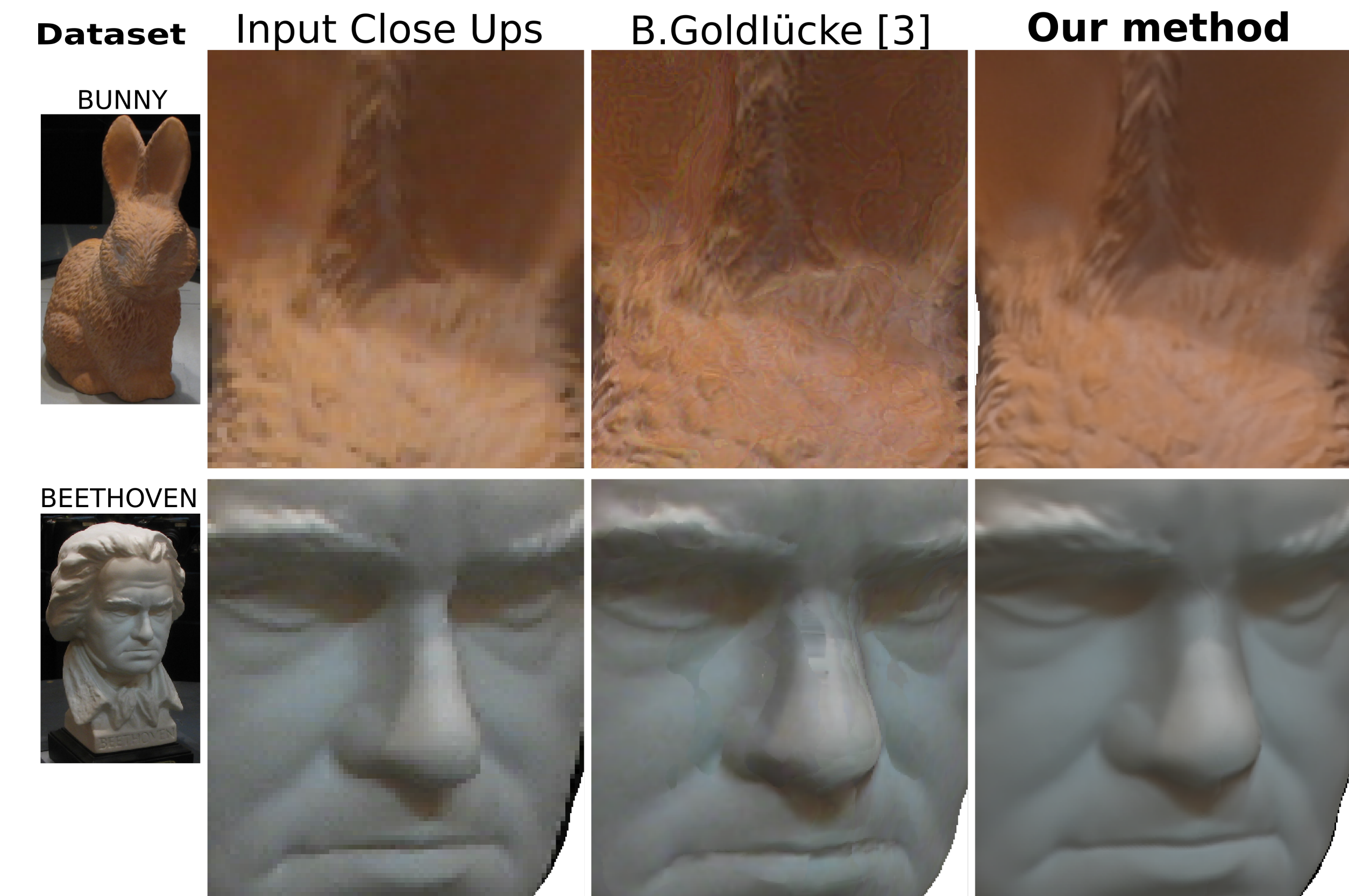


## Bayesian Inference Framework

$$\{\hat{T}, \{\hat{W}_i^t\}\} = \arg \max_{T, \{W_i^t\}} p(T, \{W_i^t\} | \{I_i^t\}) \propto p(T) \prod_{i,t} p(W_i^t) \prod_{i,t} p(I_i^t | W_i^t, T)$$

$p(T)$ : **Texture Prior Term**     $p(W_i^t)$ : **Warp Prior Term**     $p(I_i^t | W_i^t, T)$ : **Data Term**  
 Isotropic total variation norm to enforce smoothness with strong warps.    Enforces sparse variations of  $\sim$  additive noise which follows Gaussian distribution with zero mean value.

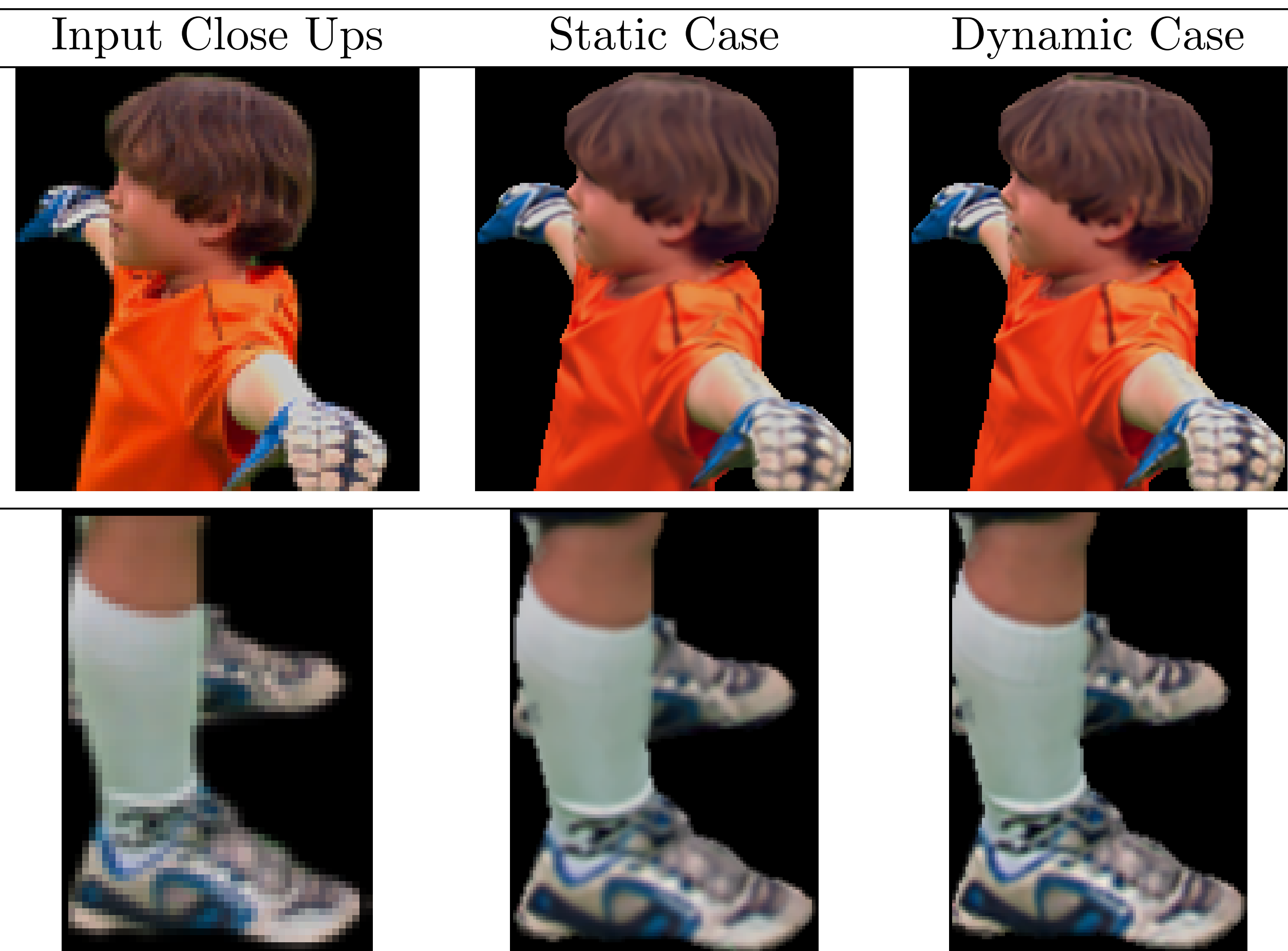
## Static Multi-View Validation



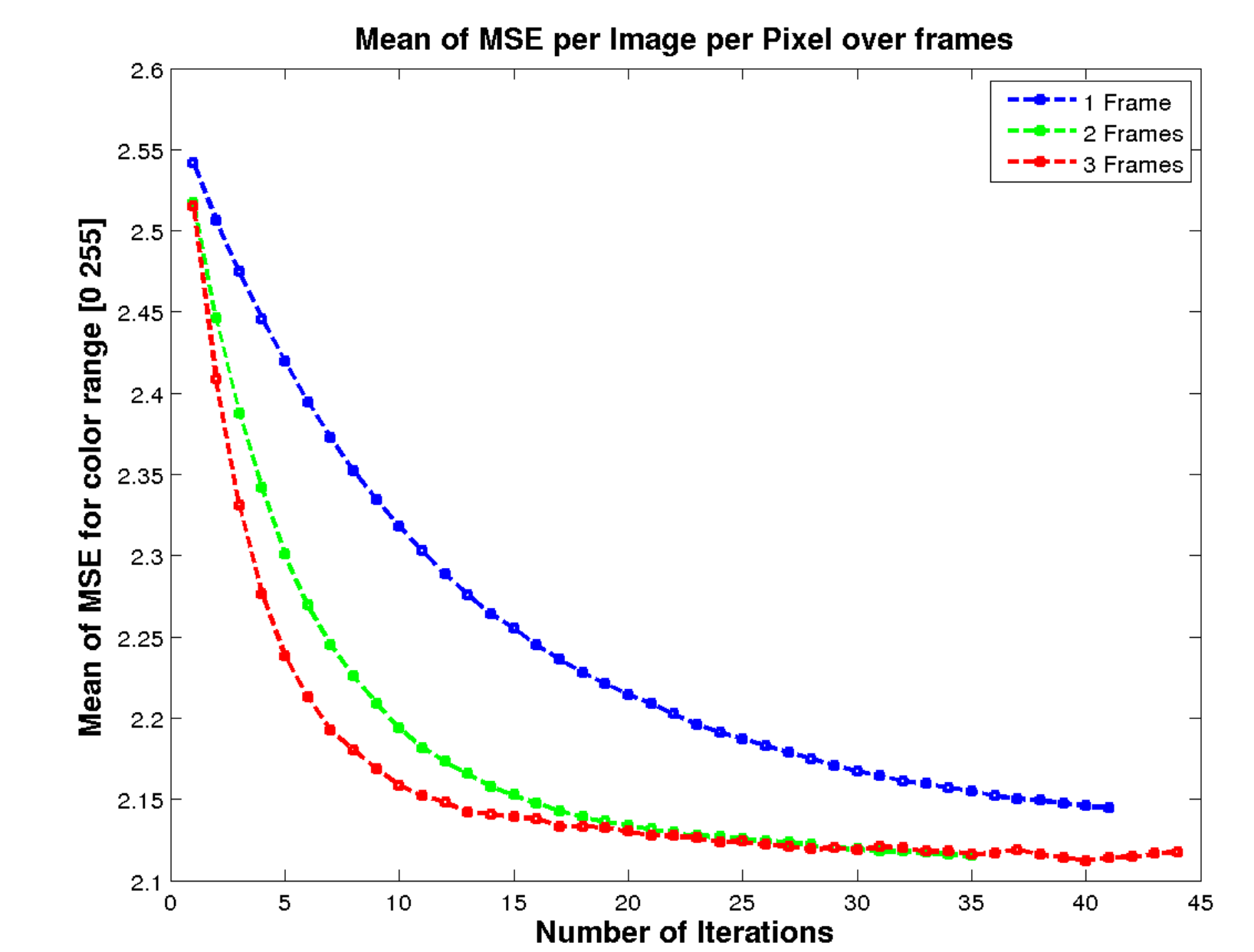
- High performance on the ear region of BUNNY dataset.
- Artifacts due to lighting conditions, to concave regions around the nose of BEETHOVEN dataset are efficiently corrected.

## Temporal Super-resolution Validation

### Qualitative Results



### Quantitative Results



### Benefits

- Better precision.
- Faster convergence.

## References

- [1] C. Liu and D. Sun. A Bayesian Approach to Adaptive Video Super Resolution. *CVPR*, 2011.
- [2] M. Eisemann, B. De Decker, M. Magnor, P. Bekaert, E. De Aguiar, N. Ahmed, C. Theobalt and A. Sellent. Floating Textures. *Computer Graphics Forum*, 2008.
- [3] B. Goldlücke, M. Aubry, K. Kolev and D. Cremers. A super-resolution framework for high-accuracy multiview reconstruction. *IJCV*, 2013.

