

Leveraging Camera Triplets for Efficient and Accurate Structure-from-Motion

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Viewgraphs in Structure-from-Motion Many Cameras Capturing Common Scene \implies Redundant Edges **Sparsify Graph** \Longrightarrow **Reduced Reconstruction Time**

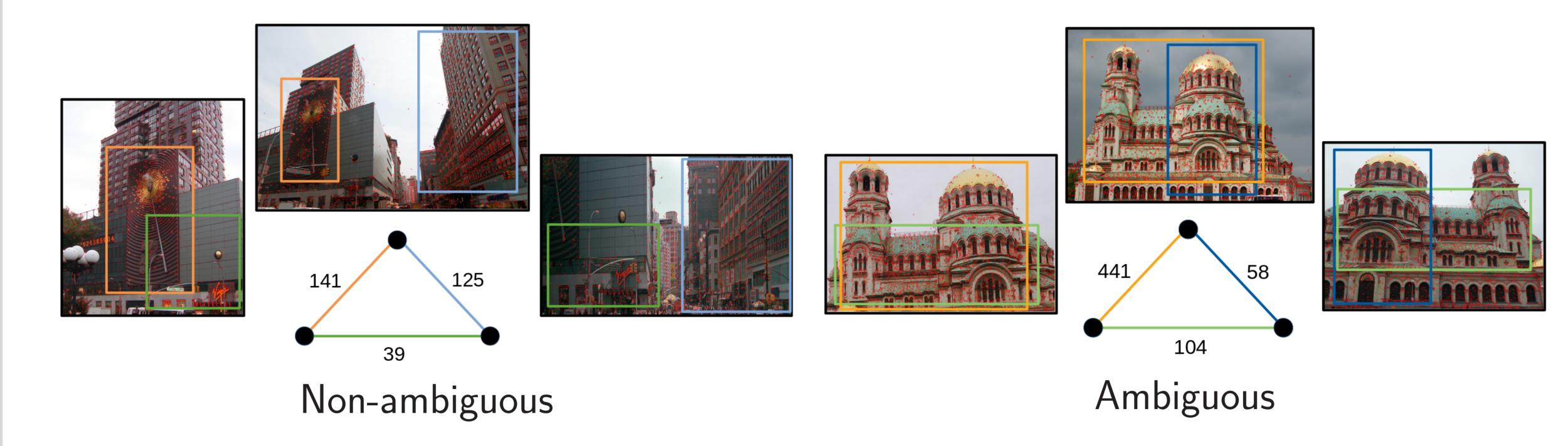
Underlying Assumptions on Viewgraphs

Repetitive Structures \implies False Edges

Remove False Edges \implies Correct Reconstruction

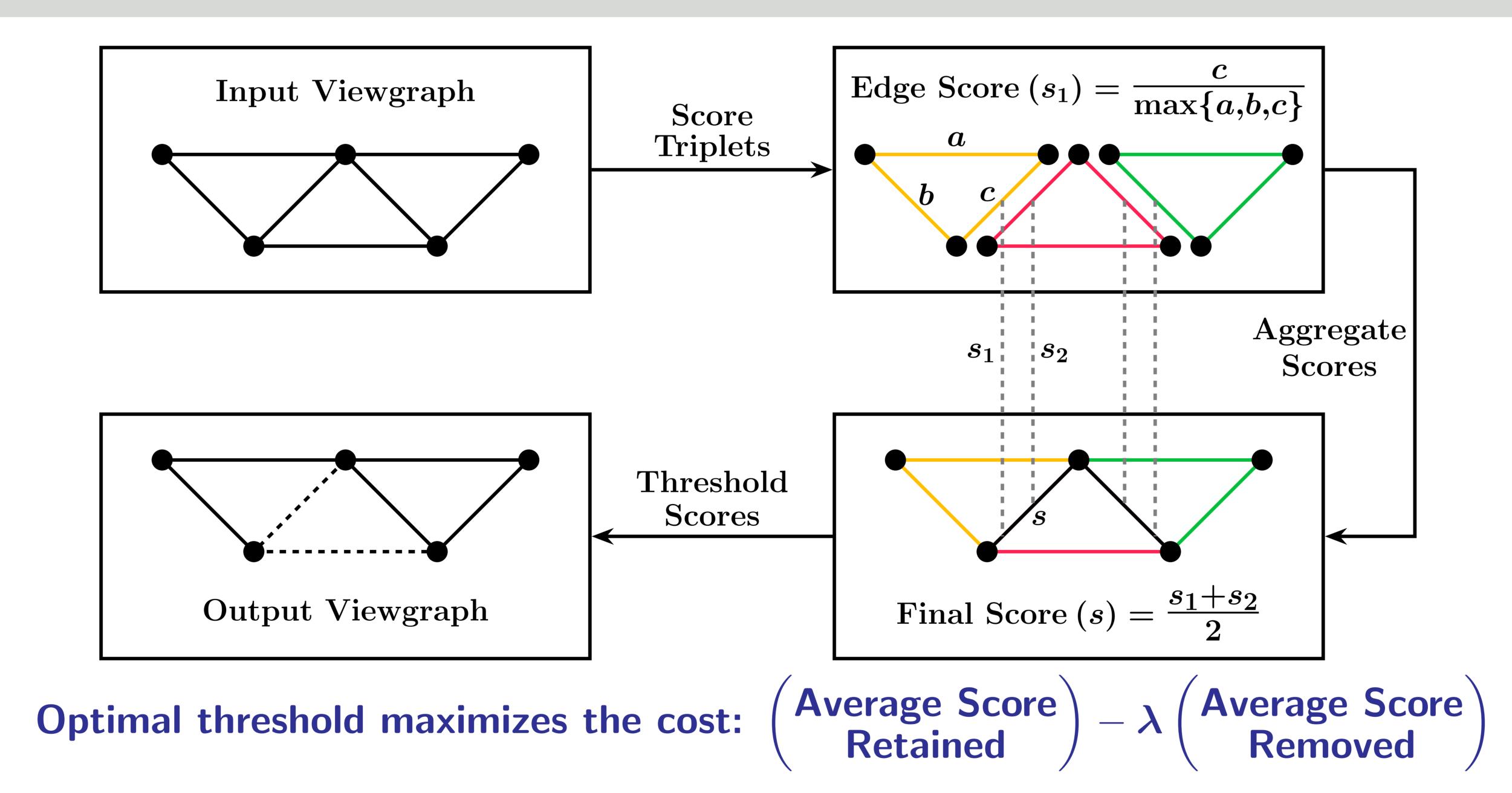
Our method simultaneously handles both tasks

Clues from Camera Triplets



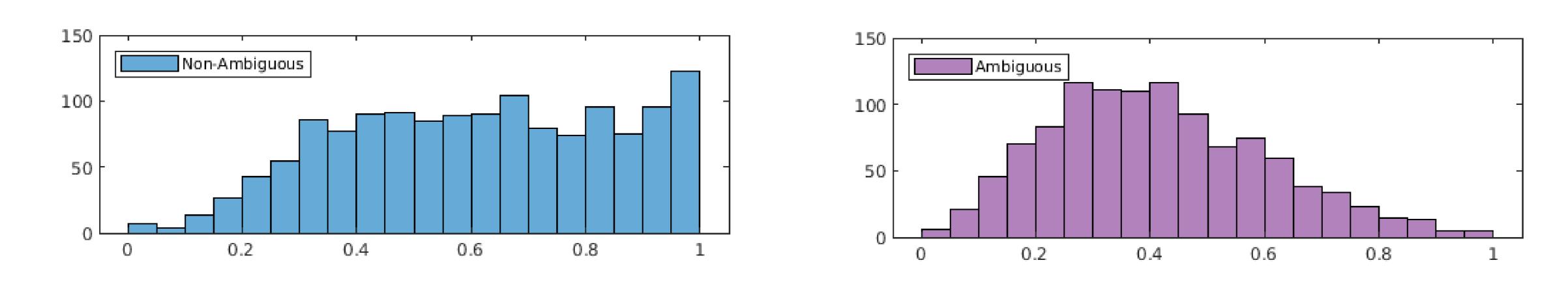
Relative proportion of epipolar inliers in a triplet contains useful information

Our Method



Analyzing Edge Scores

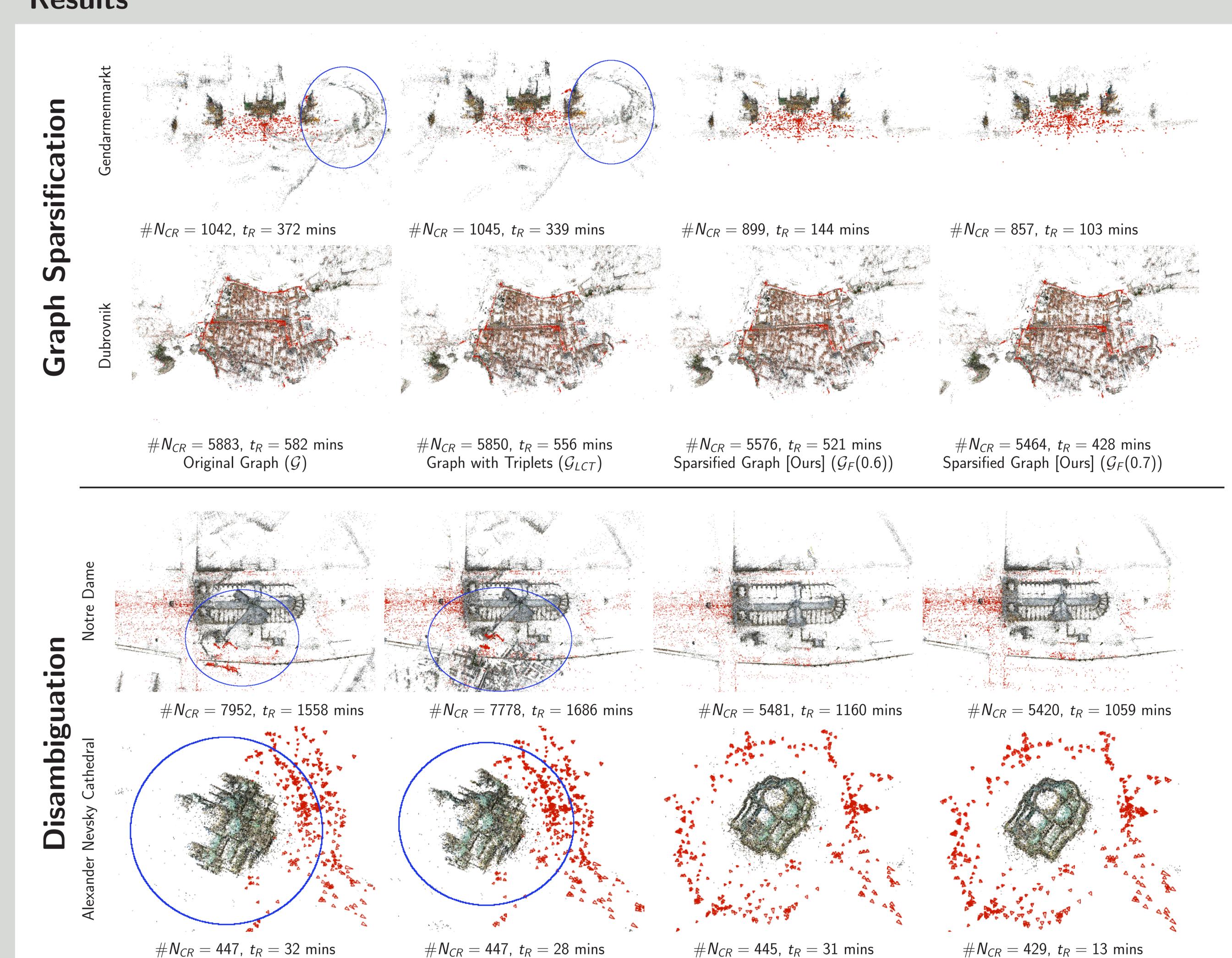
3D models from sketchfab.com



Histogram of edges scores on Doppengangers [1] datasets

Non-ambiguous edges: Wider spread aids sparsification Ambiguous edges: Low scores facilitates their removal

Results



Conclusion

Original Graph (\mathcal{G})

Relative proportion of epipolar inliers in camera triplets are useful for

• Viewgraph Sparsification

• Disambiguation

Graph with Triplets (G_{LCT})

References

[1] Cai, R., Tung, J., Wang, Q., Averbuch-Elor, H., Hariharan, B., Snavely, N.: Doppelgangers: Learning to disambiguate images of similar structures. In: ICCV (2023)

Acknowledgments

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Doppelgangers [1] (\mathcal{G}_{Dopp})

Disambiguated Graph (G_F) [Ours]