

# Learning to Estimate Hidden Motions with Global Motion Aggregation

## —Appendix—

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### 1. Screenshots of Sintel Server Results

The screenshots for Sintel Clean and Final results on the test server are shown in Figure 1. We have obtained the best overall results under the ‘EPE all’ metric. We have also obtained the best results under the ‘EPE unmatched’ metric with a large margin over previous approaches, which signifies the effectiveness of our approach in addressing the occlusion problem in optical flow estimation.

### 2. Additional Qualitative Results

Additional visualisations evaluated on the Sintel Albedo training dataset are shown in Figure 2. Note that training has not been conducted on this dataset.

We also give additional visualisations for Sintel Clean and Sintel Final test dataset in Figure 3 and Figure 5 respectively. Since no ground-truth is provided for Sintel test set, we cannot give an average EPE for each image.

Additionally, we provide qualitative results on a real-world dataset Slow Flow [1] to demonstrate the benefits of our approach on real-world data.

### References

- [1] Joel Janai, Fatma Guney, Jonas Wulff, Michael J Black, and Andreas Geiger. Slow flow: Exploiting high-speed cameras for accurate and diverse optical flow reference data. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, pages 3597–3607, 2017.



Final Clean

	EPE all	EPE matched	EPE unmatched	d0-10	d10-60	d60-140	s0-10	s10-40	s40+	
GroundTruth <sup>[1]</sup>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	<a href="#">Visualize Results</a>
<b>GMA <sup>[2]</sup></b>	<b>1.388</b>	0.582	<b>7.963</b>	1.537	0.461	0.278	0.331	0.963	7.662	<a href="#">Visualize Results</a>
RFPM <sup>[3]</sup>	1.411	0.494	8.884	1.335	0.400	0.221	0.273	0.879	8.345	<a href="#">Visualize Results</a>
RAFTwarm+AOIR <sup>[4]</sup>	1.544	0.551	9.656	1.515	0.412	0.280	0.279	0.941	9.290	<a href="#">Visualize Results</a>
MFR <sup>[5]</sup>	1.545	0.593	9.295	1.536	0.477	0.299	0.348	1.023	8.736	<a href="#">Visualize Results</a>
RAFTv2-OER-warm-start <sup>[6]</sup>	1.594	0.625	9.487	1.567	0.512	0.339	0.328	1.014	9.271	<a href="#">Visualize Results</a>
<b>RAFT <sup>[7]</sup></b>	<b>1.609</b>	0.623	<b>9.647</b>	1.621	0.518	0.301	0.341	1.036	9.288	<a href="#">Visualize Results</a>

(a) Screenshot for Sintel Clean results.



Final Clean

	EPE all	EPE matched	EPE unmatched	d0-10	d10-60	d60-140	s0-10	s10-40	s40+	
GroundTruth <sup>[1]</sup>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	<a href="#">Visualize Results</a>
<b>GMA <sup>[2]</sup></b>	<b>2.470</b>	1.241	<b>12.501</b>	2.863	1.057	0.653	0.566	1.817	13.492	<a href="#">Visualize Results</a>
RAFT+NCUP <sup>[3]</sup>	2.692	1.323	13.854	3.139	1.086	0.636	0.635	1.844	14.949	<a href="#">Visualize Results</a>
MFR <sup>[4]</sup>	2.801	1.380	14.385	3.075	1.112	0.772	0.674	1.829	15.703	<a href="#">Visualize Results</a>
RAFTwarm+AOIR <sup>[5]</sup>	2.813	1.371	14.565	3.088	1.099	0.727	0.603	1.781	16.271	<a href="#">Visualize Results</a>
RAFTv2-OER-warm-start <sup>[6]</sup>	2.831	1.396	14.536	3.109	1.133	0.742	0.628	1.798	16.259	<a href="#">Visualize Results</a>
<b>RAFT <sup>[7]</sup></b>	<b>2.855</b>	1.405	<b>14.680</b>	3.112	1.133	0.770	0.634	1.823	16.371	<a href="#">Visualize Results</a>

(b) Screenshot for Sintel Final results.

Figure 1. Screenshots for Sintel Clean and Final results on the test server. Our proposed approach GMA ranks first on both datasets under the ‘EPE all’ metric as of March 17th, 2021. We also rank first under the ‘EPE unmatched’ metric, with a large margin over previous approaches. This signifies the usefulness of addressing the occlusion problem in optical flow.

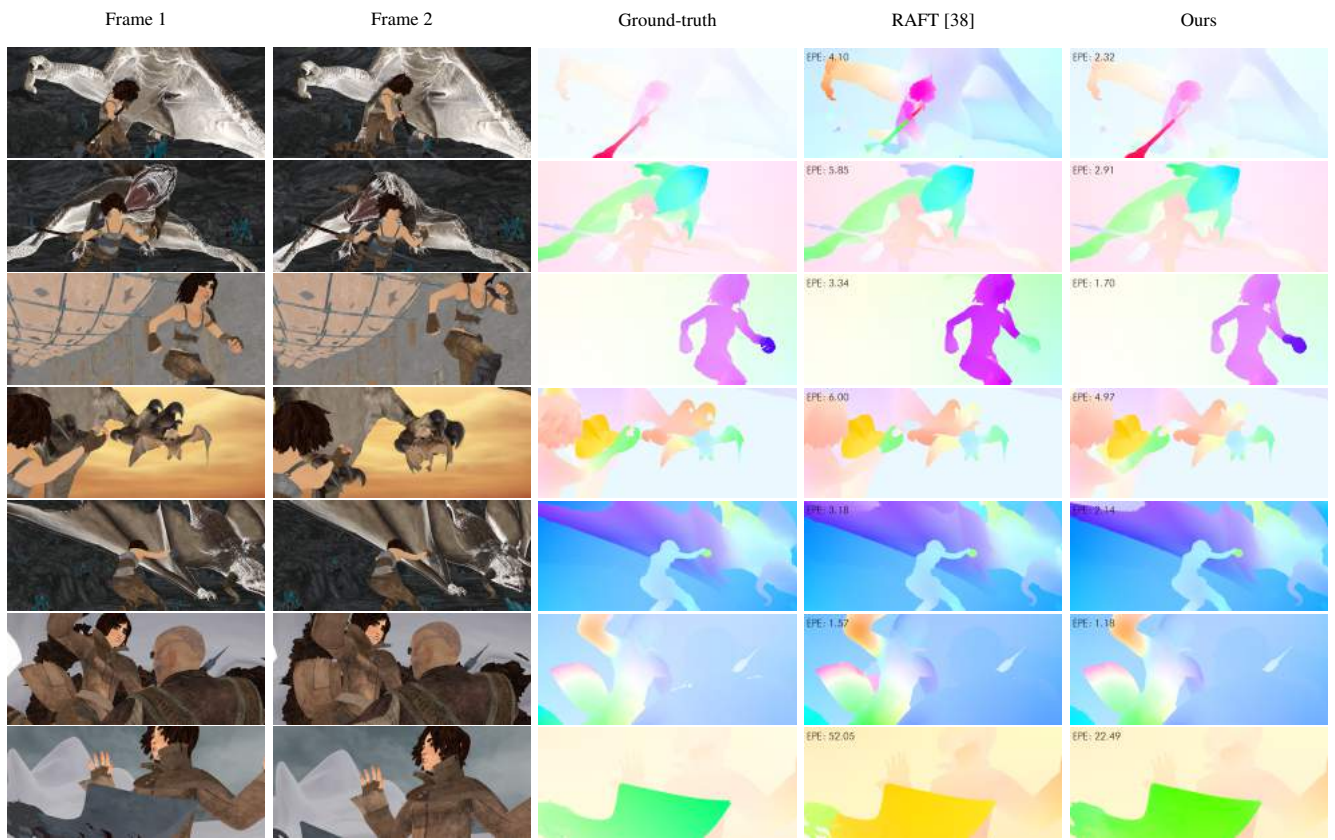


Figure 2. Additional visualisations evaluated on the Sintel Albedo training dataset.



Figure 3. Additional visualisations evaluated on the Sintel Clean test dataset.

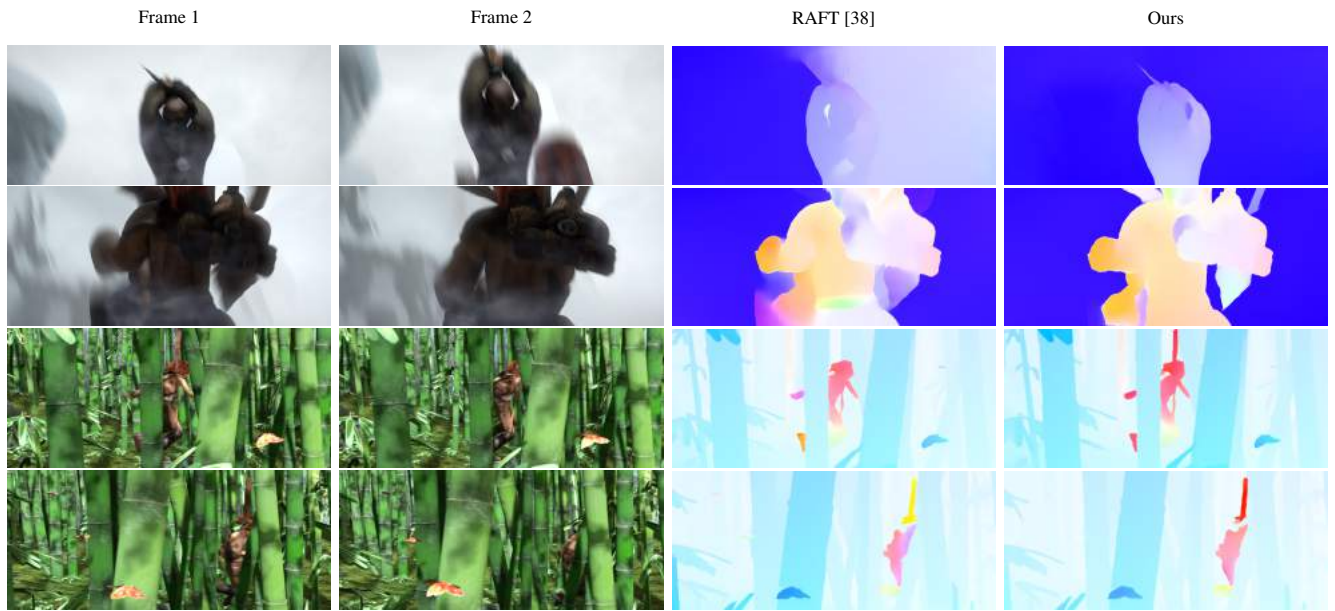


Figure 4. Additional visualisations evaluated on the Sintel Final test dataset.

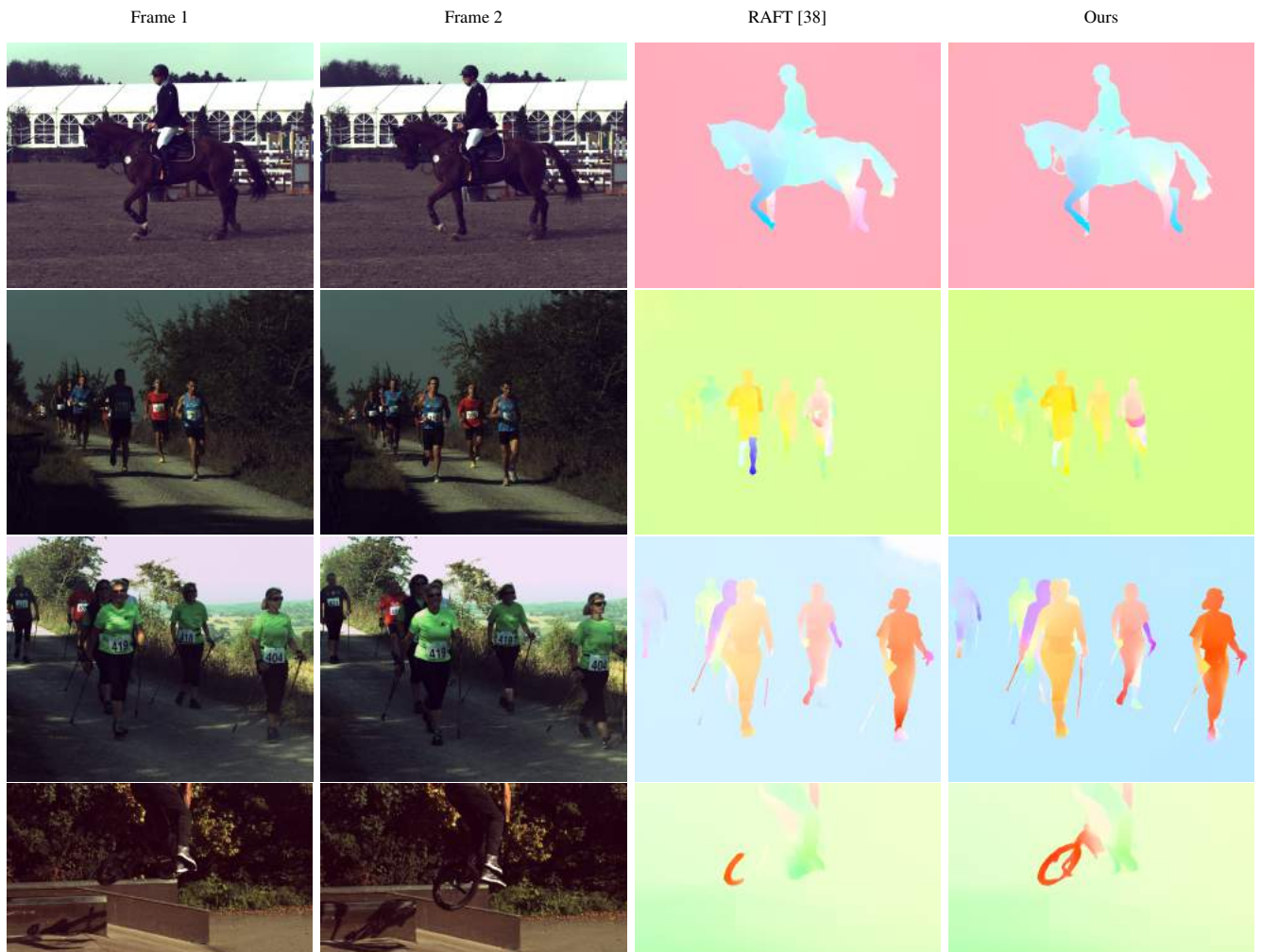


Figure 5. Additional visualisations evaluated on the SlowFlow dataset.