

Texture and Exposure Awareness based Refill for HDRI Reconstruction of Saturated and Occluded Areas

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Background



Image taken by



Low Dynamic Range Image (LDRI)



Reconstructed by set of exposure-bracketed LDRI

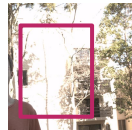
High Dynamic Range Image (HDRI)

Problem

For same area of input LDRIs:



Occluded in lower-exposed



Saturated in middle-exposed

HDRI result



Cause heavy ghost artifacts

Solution

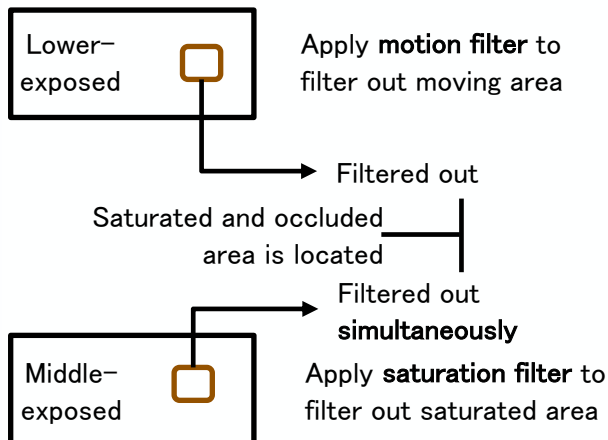
Proposal 1: Filter based target area locating

Proposal 2: Texture awareness refill

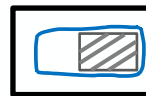
Proposal 3: Exposure awareness refill

Proposals

P1: Saturation and motion filters based saturated and occluded area locating

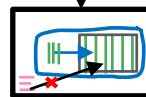


P2: Texture and spatial restrictions based texture awareness refill



Make the **restriction** to ensure the adequacy of refill

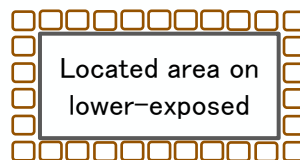
Select textures **only** come from



Refill the selected **background texture** in located area

P3: Surrounding area analysis based exposure awareness refill

First



Analyse surrounding patches

Then

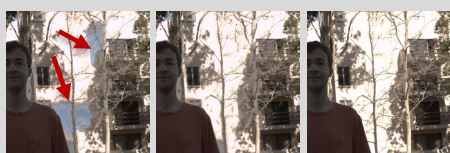


Tile and refill **brightest surrounding patch** from background into located area

Experiment result

Use Sen as basement conventional work

Subjective evaluation



Conventional work alone Integrated with my work Ground truth

Objective evaluation

Set No.	Conventional work alone	Integrated with my work		
		P1+P2 (midterm)	P1+P2+P3	
			Score	Improved by
1	49.92	48.67	51.06	2.28%
2	49.56	50.00	49.79	0.46%
3	48.45	49.41	49.78	2.75%
4	45.99	48.80	51.00	10.89%
5	55.43	55.95	55.95	0.94%
6	48.89	49.03	49.03	0.18%
7	50.29	52.36	52.36	4.12%

Conclusion

- Based on subjective evaluation, 16 out of 17 artifacts in experiment have been improved.
- Improve the HDR-VDP-2 objective evaluation result for conventional work Sen and Deng by 3.24% and 1.45% respectively.

