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

Background

Image taken by

Low Dynamic Range Image (LDRI)
Reconstructed by set of exposure-bracketed LDRI

High Dynamic Range Image (HDR)

Problem

For same area of input LDRIs:

Occluded in lower-exposed
Saturated in middle-exposed

 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

Apply motion filter to filter out moving area

Saturated and occluded area is located

Filtered out simultaneously

Apply saturation filter to filter out saturated area

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

Located area on lower-exposed

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

Objective evaluation

<table>
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<tr>
<th>Set No.</th>
<th>Conventional work alone</th>
<th>Integrated with my work</th>
<th>P1+P2</th>
<th>P1+P2+P3</th>
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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.