

Title [MIV] Basic tiles

Source PUT, ETRI

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Abstract

The document presents a proposal of splitting basic views into basic and non-basic tiles. Only basic tiles are packed to the atlas without pruning, while non-basic tiles are treated as additional views (are pruned, split, and packed as a mosaic of patches). Proposed approach is adapted for class B sequences (full 360 scene, non-full 360 cameras) and allows for packing non-pruned information from more directions. The recommendation is to include the proposal into TMIV 17.

1 Proposal

We propose to modify a TMIV encoder (MIV Main anchor) by splitting input views into two tiles: basic (central part of the view, dark blue in Fig. 1B) and non-basic (pale blue, Fig. 1B). The splitting is performed before view labeling. All the non-basic tiles are being pruned (orange patches in Fig. 1A). Basic/additional labeling is performed only on basic tiles. The most distant ones (the view labeling algorithm was not modified) are packed without pruning (dark blue, Fig. 1A). The rest is labeled as additional (thus pruned, split, and packed – pale blue in Fig. 1A).

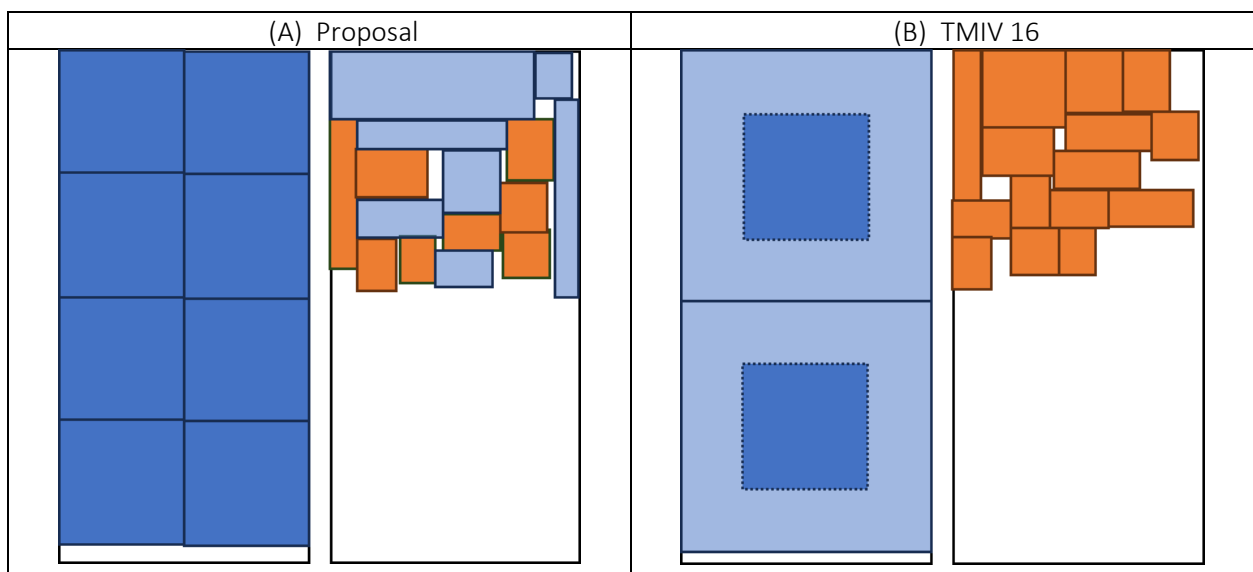
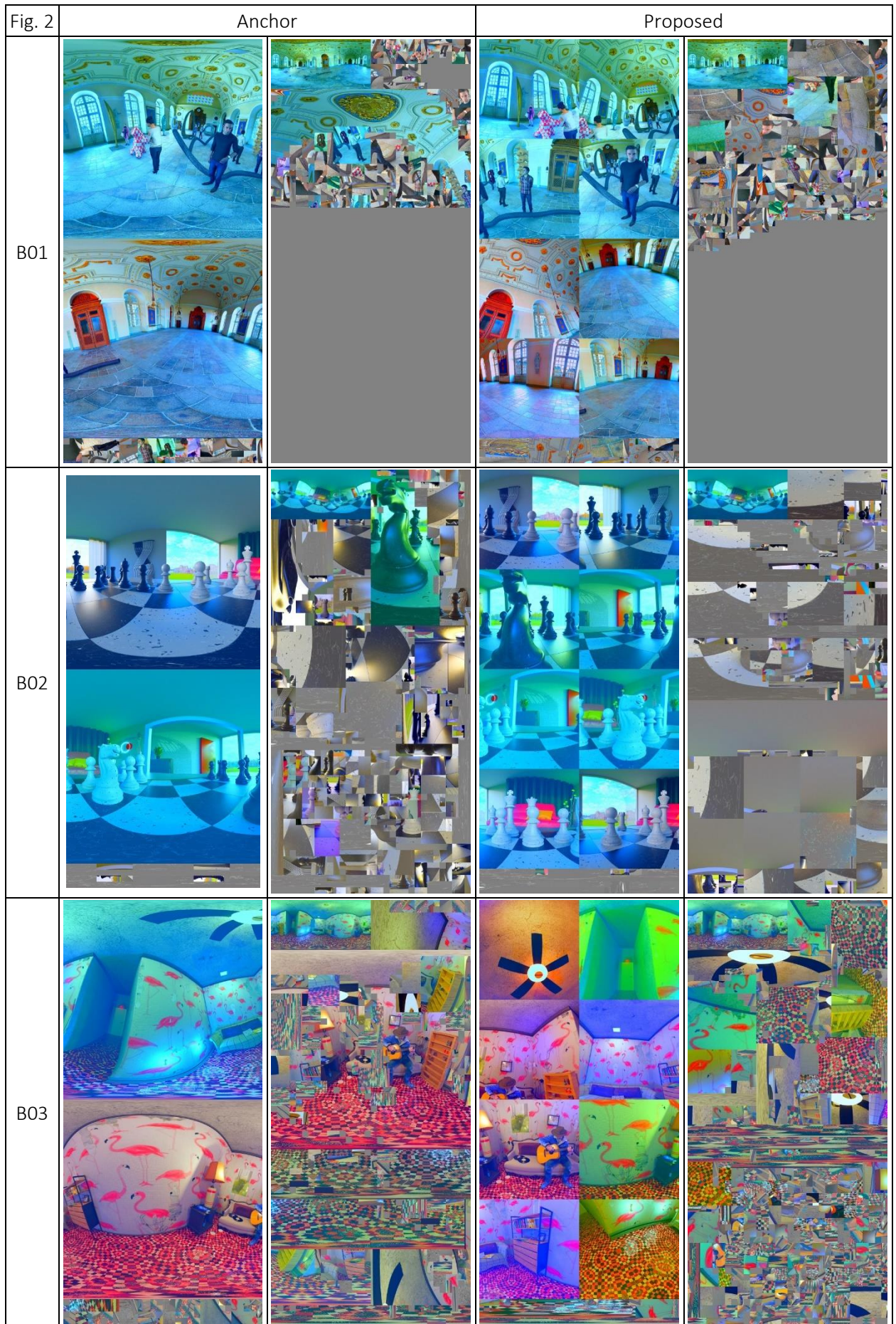
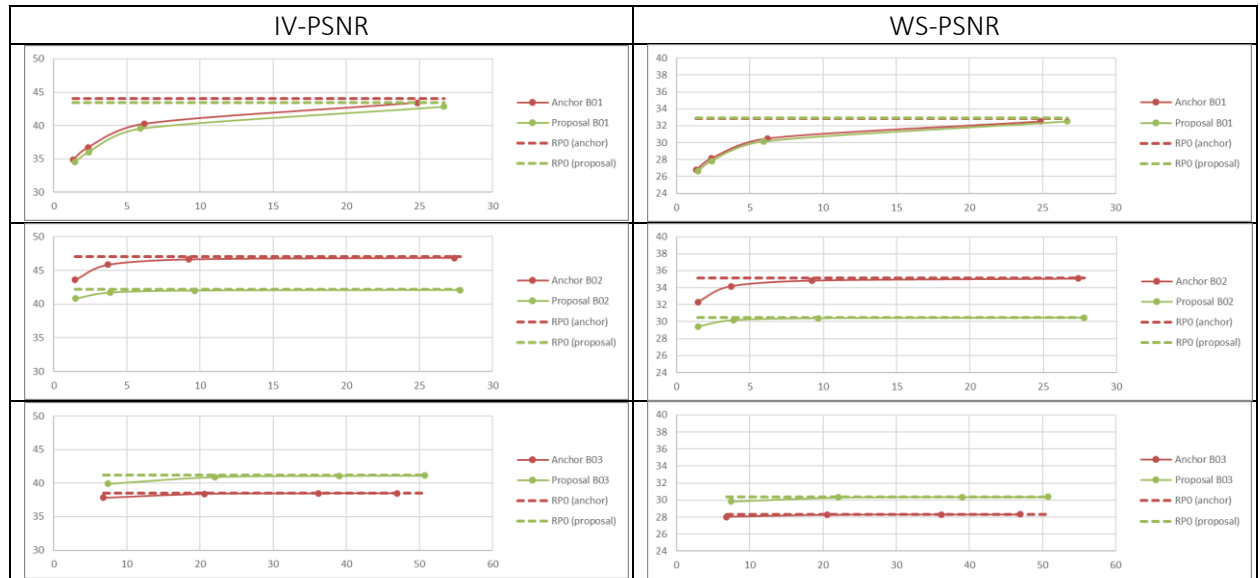


Fig. 1. Atlases in the proposed approach and TMIV 16.



2 Results (A65)

| Class B | | | | | Max delta Y-PSNR [dB] | | | Max delta IV-PSNR [dB] | | | |
|----------------|---------|---------|---------|--------------|-----------------------|--------------|-------------|------------------------|--------------|-------------|---------------|
| Sequence | BD-rate | BD-rate | BD-PSNR | BD-PSNR | MIV | m63824 | Difference | MIV | m63824 | Difference | |
| | Y-PSNR | IV-PSNR | Y-PSNR | IV-PSNR | Main | | [%] | Main | | [%] | |
| Museum | B01 | 12.9% | 25.1% | -0.6% | -1.6% | 18.79 | 3.72 | -80.2% | 19.38 | 2.82 | -85.4% |
| Chess | B02 | --- | --- | -12.7% | -9.8% | 8.91 | 12.63 | 41.9% | 12.83 | 13.13 | 2.3% |
| Guitarist | B03 | --- | --- | 7.1% | 6.5% | 22.66 | 9.80 | -56.7% | 21.03 | 10.88 | -48.3% |
| Average | | --- | --- | -2.1% | -1.6% | 16.79 | 8.72 | -31.7% | 17.75 | 8.94 | -43.8% |



Why is there an objective quality loss?

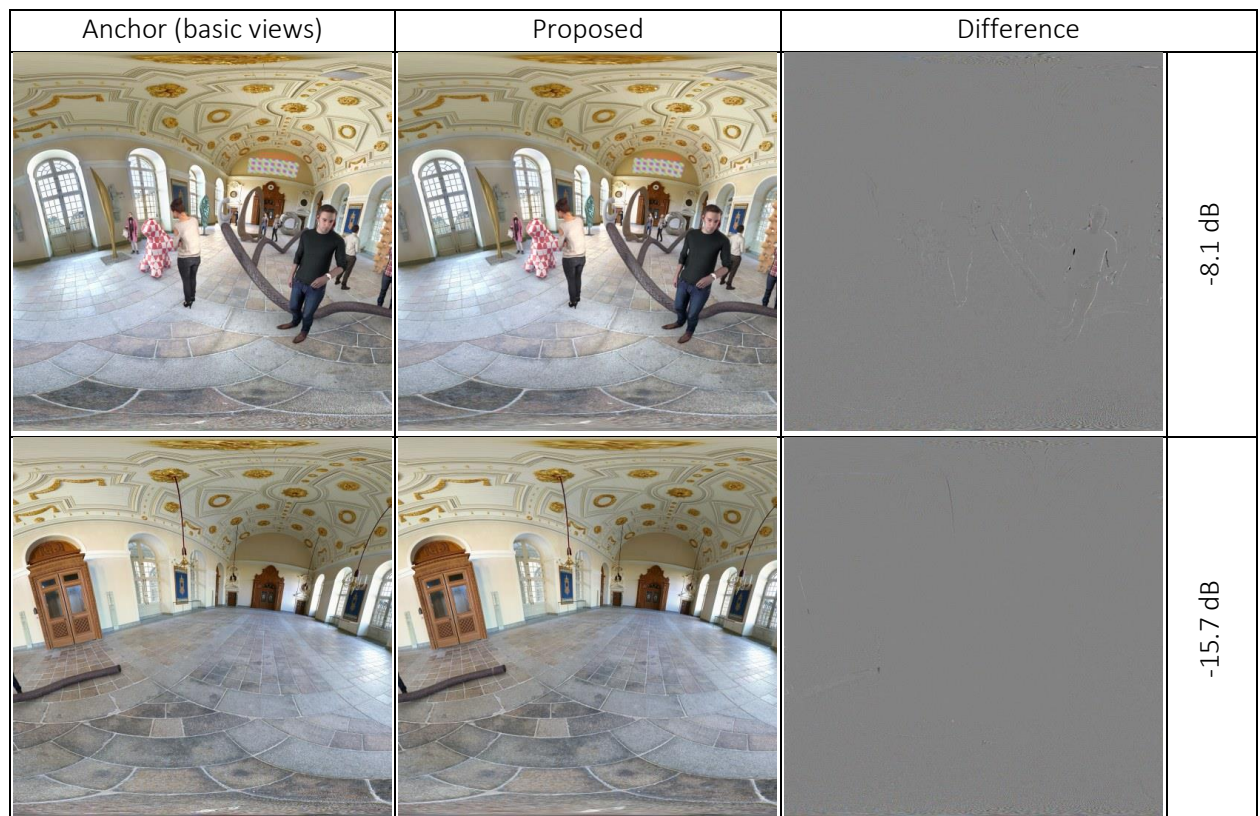


Fig. 3. Views with highest quality loss, B01.







| Anchor (basic views) | Proposed | Difference | |
|---|---|--|---------|
|  |  |  | -9.4 dB |
|  |  |  | -7.4 dB |

Fig. 4. Views with highest quality loss, B02.

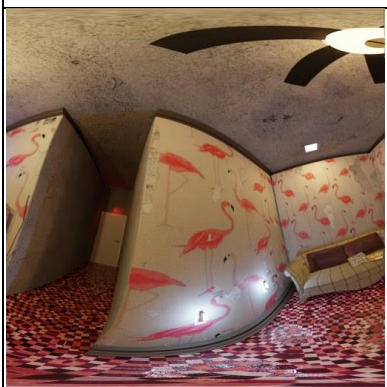
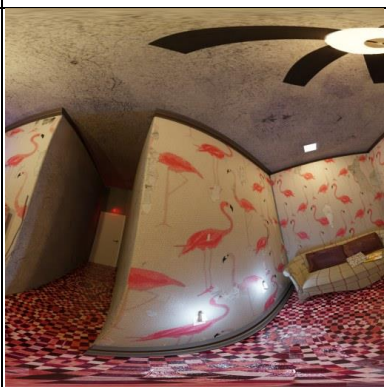
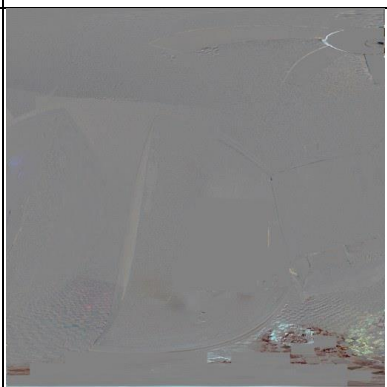


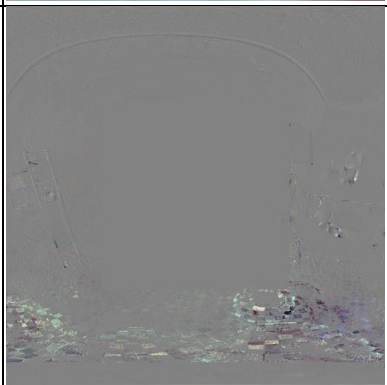
| Anchor (basic views) | Proposed | Difference | |
|---|---|--|----------|
|  |  |  | -14.6 dB |
|  |  |  | -16.3 dB |

Fig. 5. Views with highest quality loss, B03.

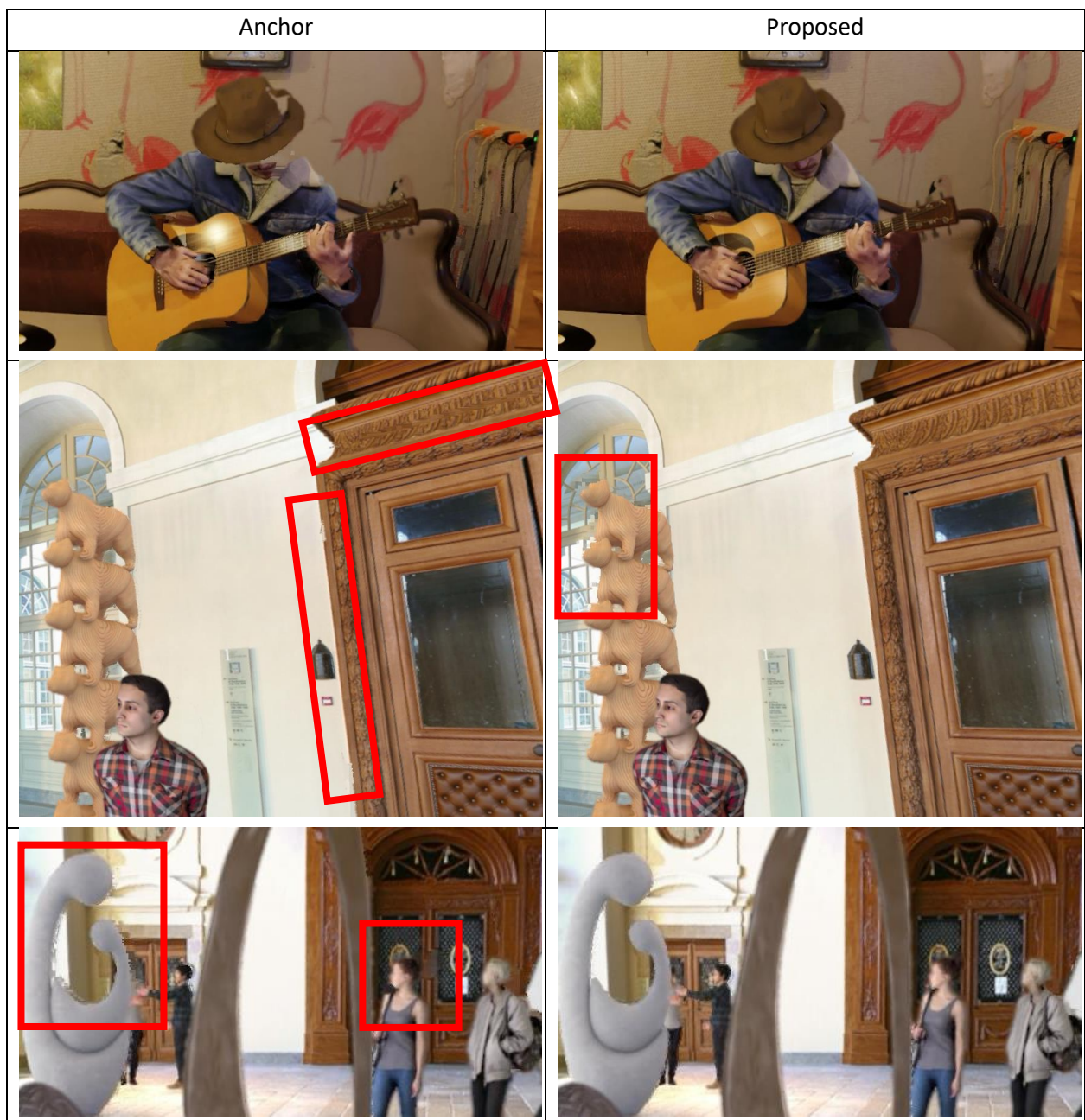
The proposal significantly decreases Δ PSNR for both objective metrics for sequences B01 and B03.

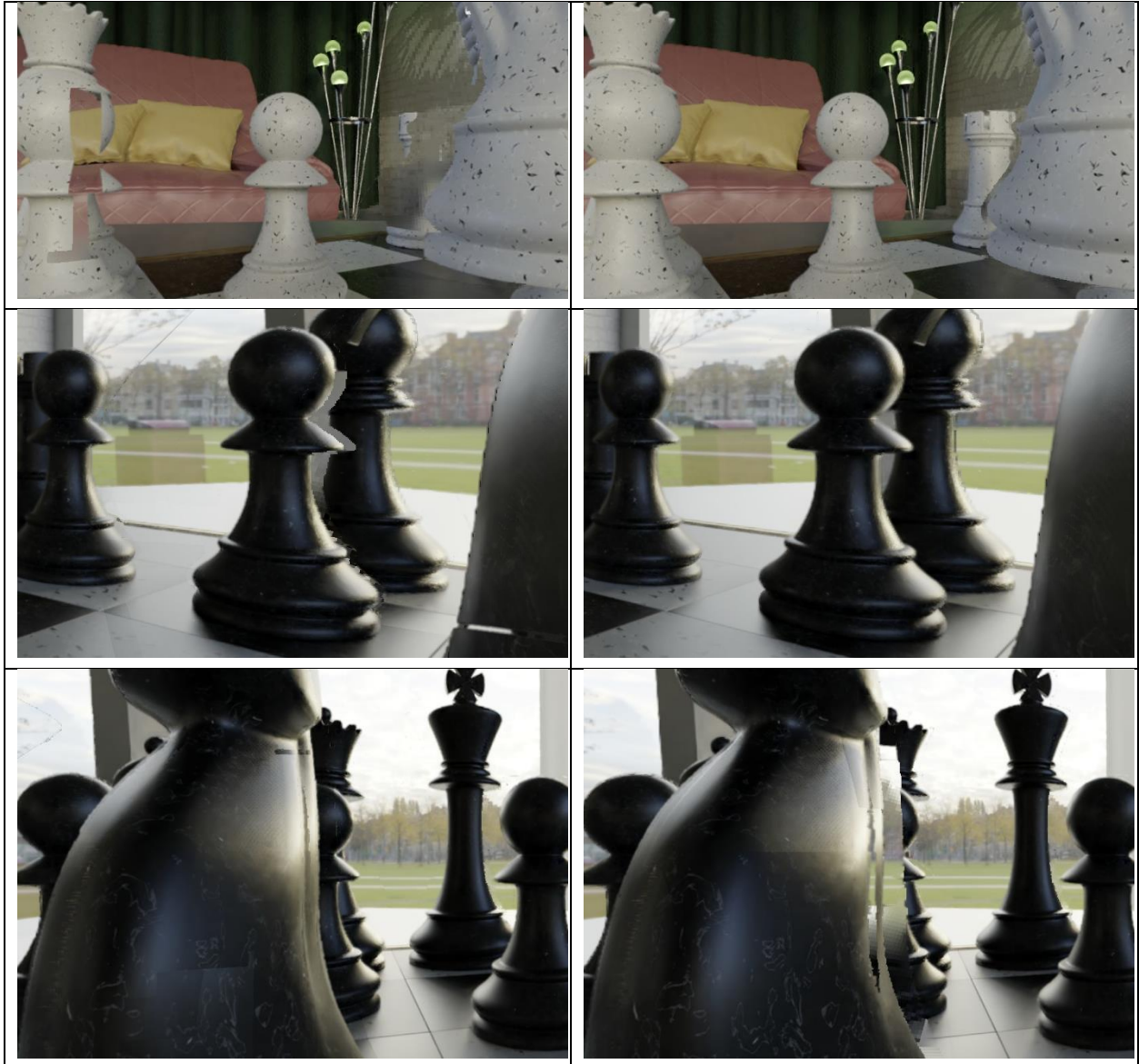
Reason: full basic views are not transmitted anymore.

For B02 sequence Δ IV-PSNR is slightly higher and Δ WS-PSNR is higher than for TMIV16, because the quality of v0 (top) and v9 (bottom) views dropped by ~ 7 dB for RP0. Reason: parts of these views were transmitted within basic views, and are not transmitted in basic tiles.

Subjectively, we believe that the quality of posetraces is:

- significantly higher for B03 (e.g., no missing parts of guitarist's head),
- similar for B01 (slightly different artifacts in various parts of the scene),
- different for B02 (different parts of the scene are missing because of overfilled atlases).





3 Recommendation

We recommend including the proposed modification in TMIV17.

4 Acknowledgement

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