SUPPLEMENTAL MATERIAL

A Psychophysically Validated Metric for Bidirectional Texture Data Reduction

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This document is supplemental material to the paper titled *A Psychophysically Validated Metric for Bidirectional Texture Data Reduction* published in special issue of ACM Transactions on Graphics (proceedings of ACM SIGGRAPH ASIA 2008). For further information refer either to the original paper or contact the authors.

This material shows more results of application of the proposed technique in BTF visual equivalence and compression using averaged measured perceptual thresholds $\hat{\varepsilon}$ shown in the third column of Tab. 4 in the paper.

1   Validation of the Method - Results of Automatic Threshold Settings

Figure 1 shows renderings of *sphere* using automatically estimated thresholds ε_σ for point light (from front and left) and for the *grace* environment.

2   BTF Visual Equivalence

Figure 2, Figure 3, Figure 4, Figure 5, and Figure 6 show BTF visual equivalence based on estimated, material dependend, perceptually measured thresholds $\hat{\varepsilon}$ for all the tested illumination evironments (*point-light*, *grace*, *grassplain*) and scene objects (*sphere*, *tablecloth*, *bunny*). All shows original and the selected subset renderings accompanied with results of Visible Difference Predictor [Daly, S. 1993].

3   BTF Compression

Figure 7 compares results of entire BTF compression (LPCA) and the selected subset compression (LPCA+) for all tested BTF samples in terms of compression ratio and visual difference.
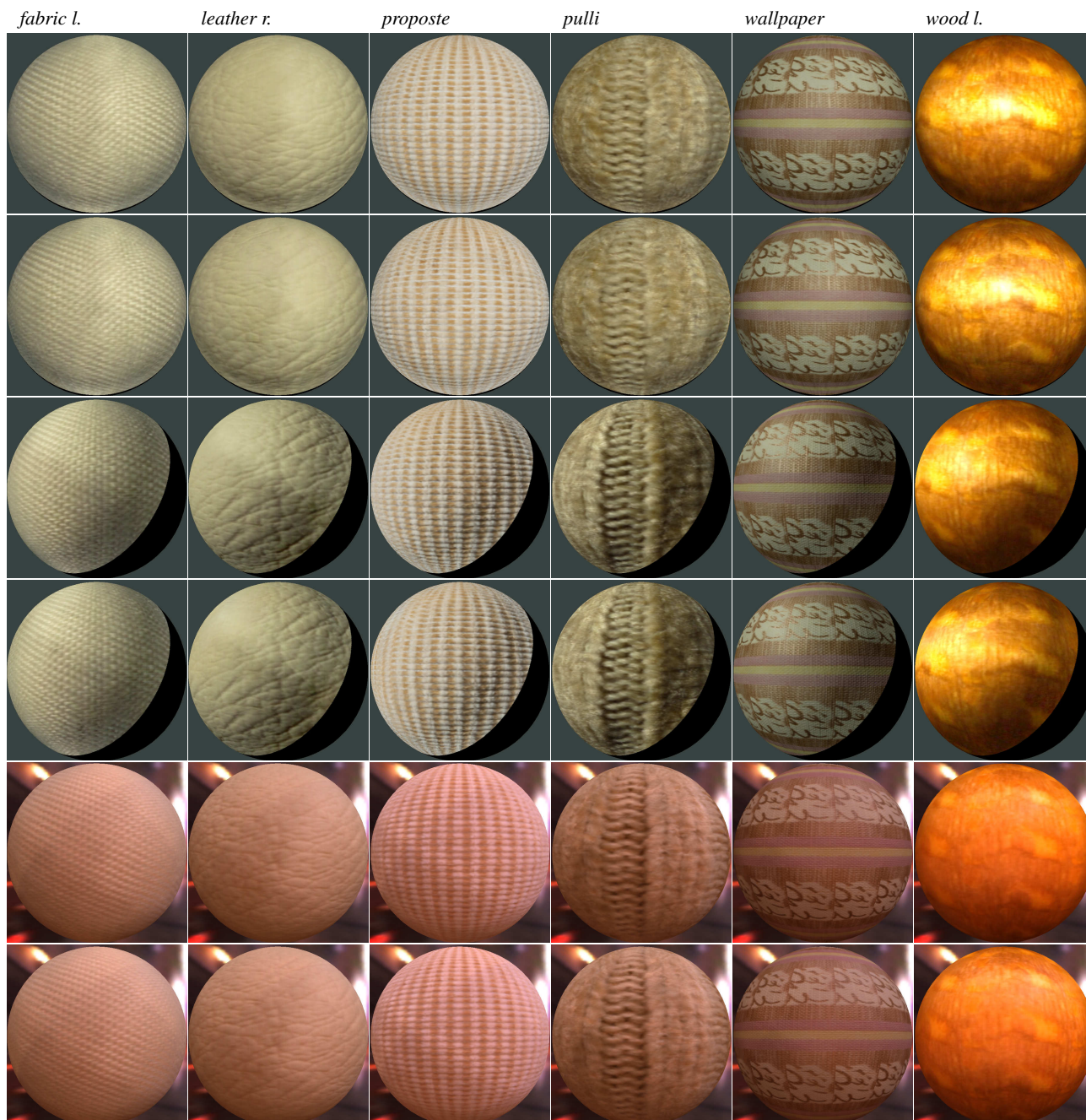
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Figure 1: *Original validation samples renderings (odd rows) compared with their perceptually equivalent renderings from the subset of the sample (even rows), for point-light from front and left and* grace *environment. The automatically estimated thresholds ε_σ are shown in Figure 11.*

original	degraded	VDP	original	degraded	VDP

Figure 2: *Renderings of degraded images visually equivalent with original BTF, for pointlight (first column) and* grace *(second column) environment for all tested samples. Corresponding visual difference predictor result is shown in third column, respectively.*
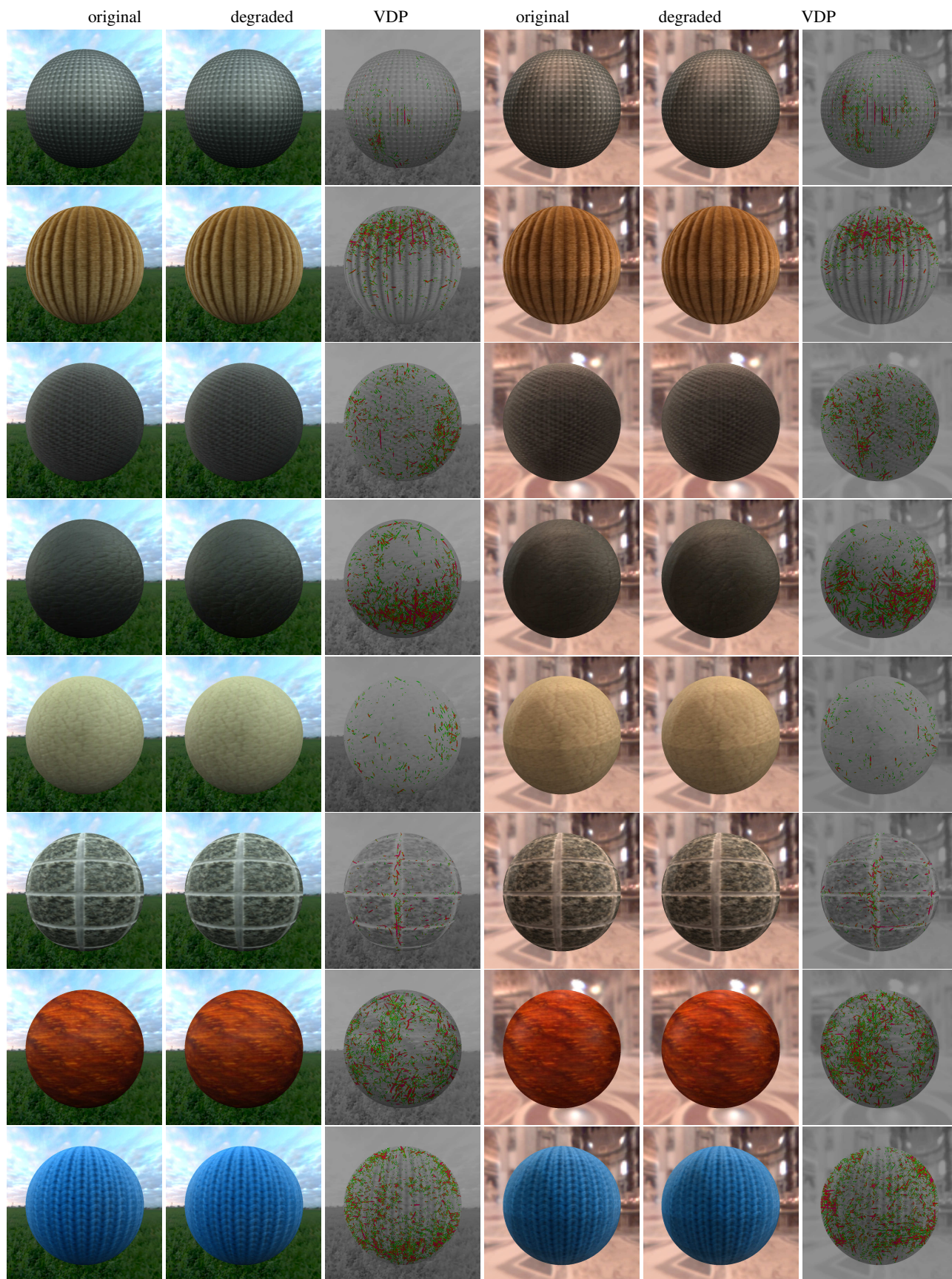
Figure 3: *Renderings of degraded images visually equivalent with original BTF, for* grassplain *(first column) and* stpeters *(second column) environment for all tested samples. Corresponding visual difference predictor result is shown in third column, respectively.*

Figure 4: *Renderings of degraded images visually equivalent with original BTF, for pointlight (first column) and* grace *(second column) environment for all tested samples. Corresponding visual difference predictor result is shown in third column, respectively.*

original	degraded	VDP	original	degraded	VDP

Figure 5: *Renderings of degraded images visually equivalent with original BTF, for pointlight (first column) and* grace *(second column) environment for all tested samples. Corresponding visual difference predictor result is shown in third column, respectively.*
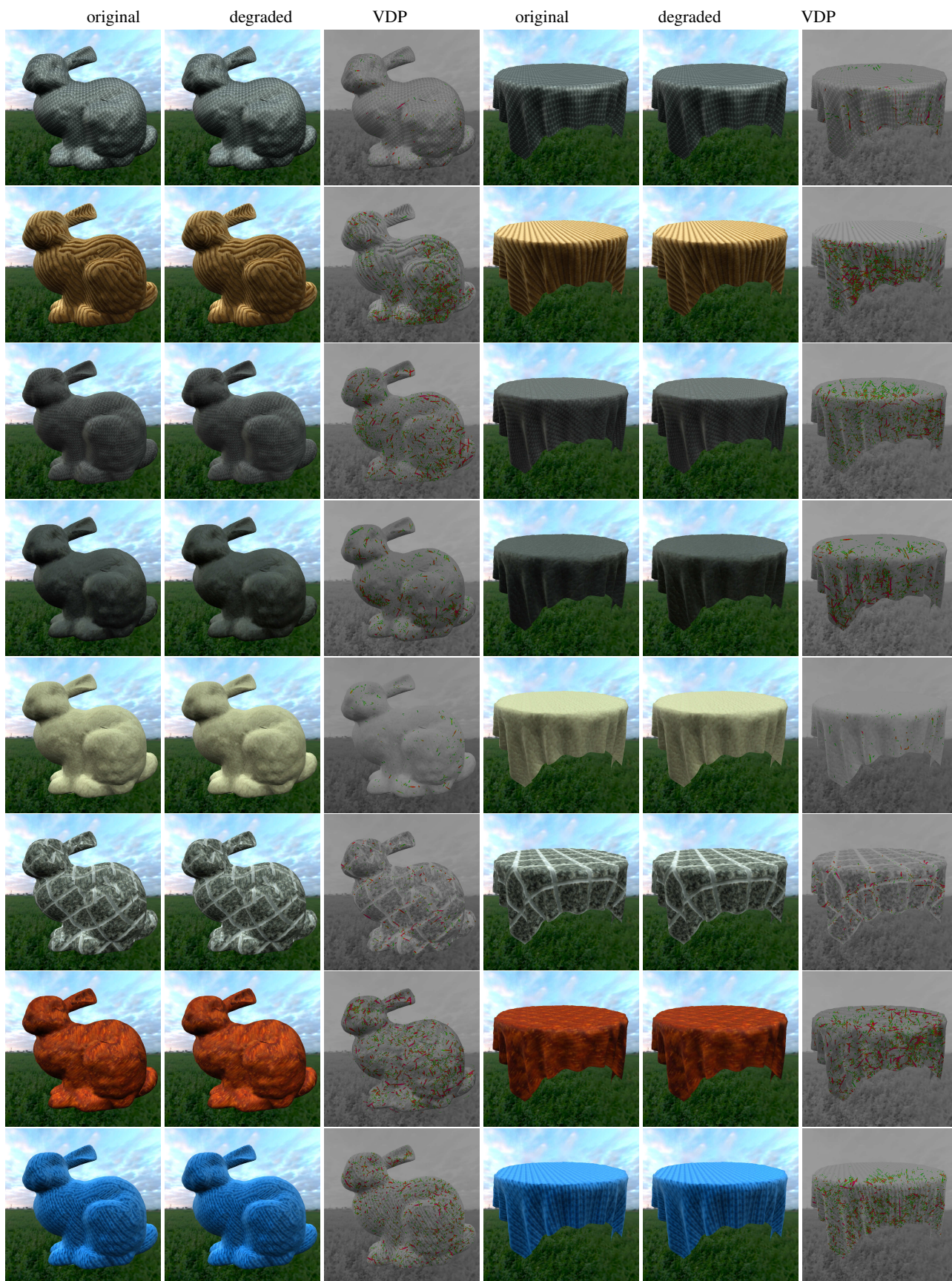
original   degraded   VDP   original   degraded   VDP

Figure 6: *Renderings of degraded images visually equivalent with original BTF* grassplain *and two objects* bunny *(first column)* tablecloth *(second column) environment for all tested samples. Corresponding visual difference predictor result is shown in third column, respectively.*
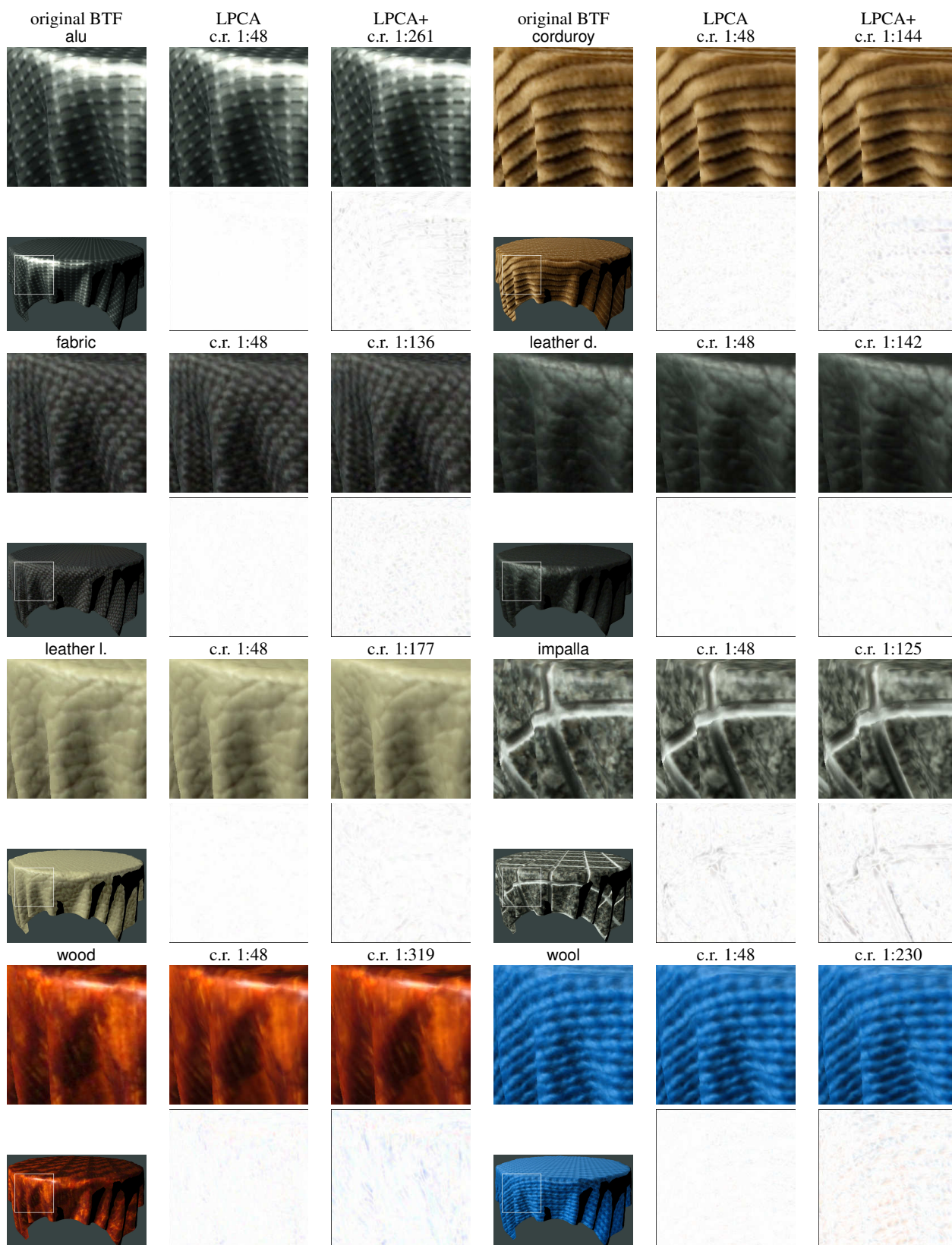
Figure 7: *Comparison of original BTF rendering with compression of full BTF sample (LPCA) and its perceptually important subset only (LPCA+). The odd rows shows renderings for point-light from the left, while the even rows show rendering context and introduced error from original data.*