Acoustic Classification and Optimization for Multi-Modal Rendering of Real-World Scenes (Supplementary Material)

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Index Terms—Sound propagation, material optimization, recognition

In this supplementary document, we present further results and analysis related to our algorithm and implementation. These include:

- Additional viewpoints of the material classification results.
- Optimization results for additional listener positions in the four benchmark scenes.

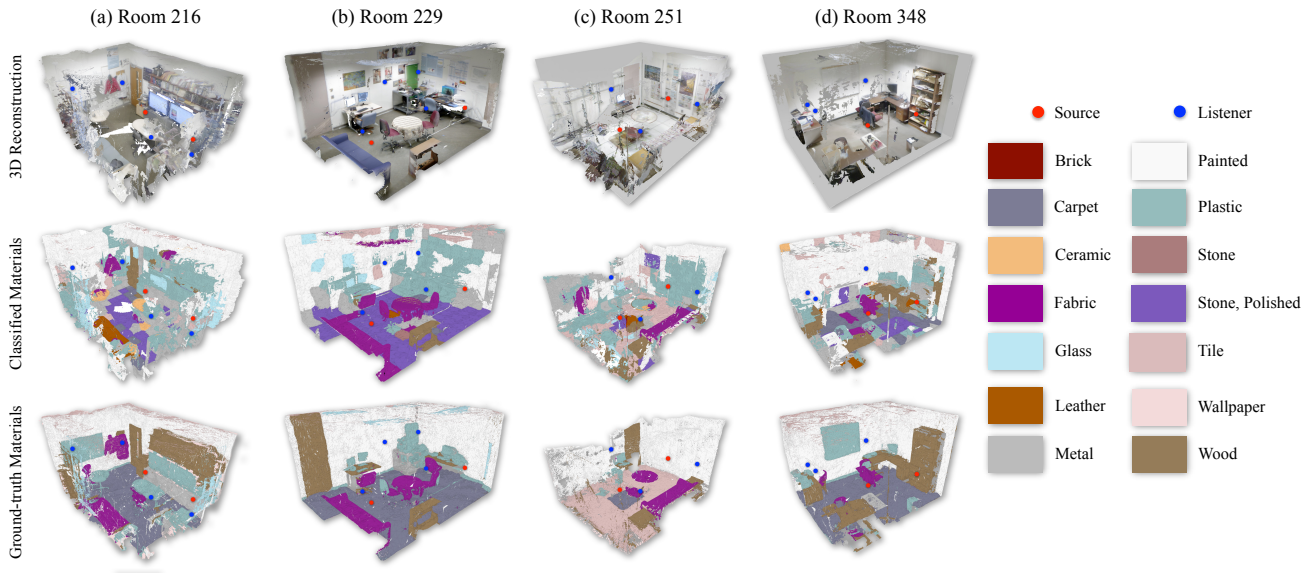

Fig. 1: An alternate view of the results of our visual material classification algorithm for the four benchmark scenes. Colors indicate the material category that has been assigned to each triangle. The middle row shows the results of our material classification, and the bottom row shows the manually-generated ground-truth classification. The source and listener positions for the acoustic measurements are shown as red and blue circles, respectively. These are used to compute the RT_{60} values used by the optimization algorithm.

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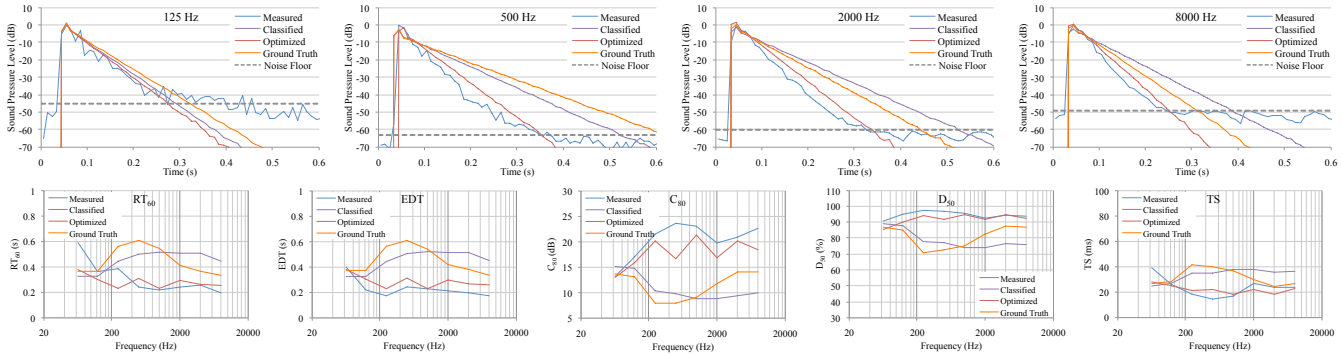
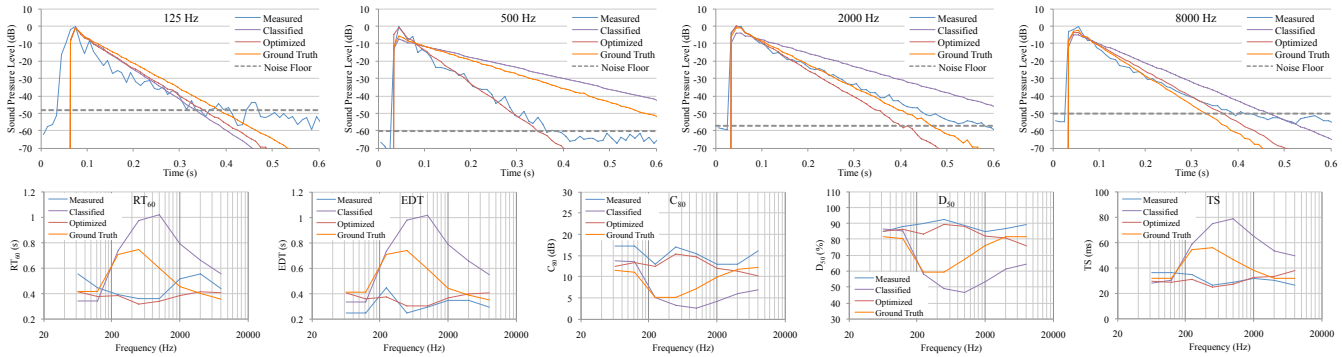
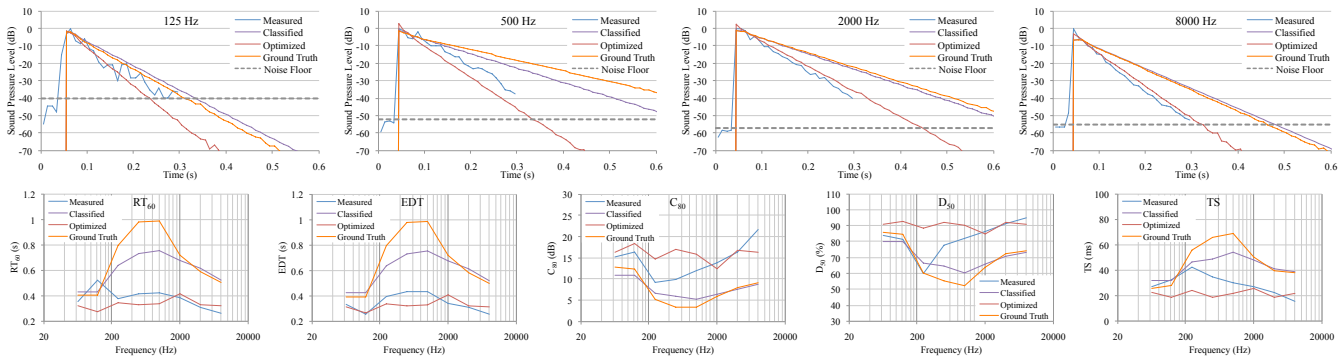
(a) Room 216, IR 2



(b) Room 229, IR 2



(c) Room 251, IR 2



(d) Room 348, IR 2

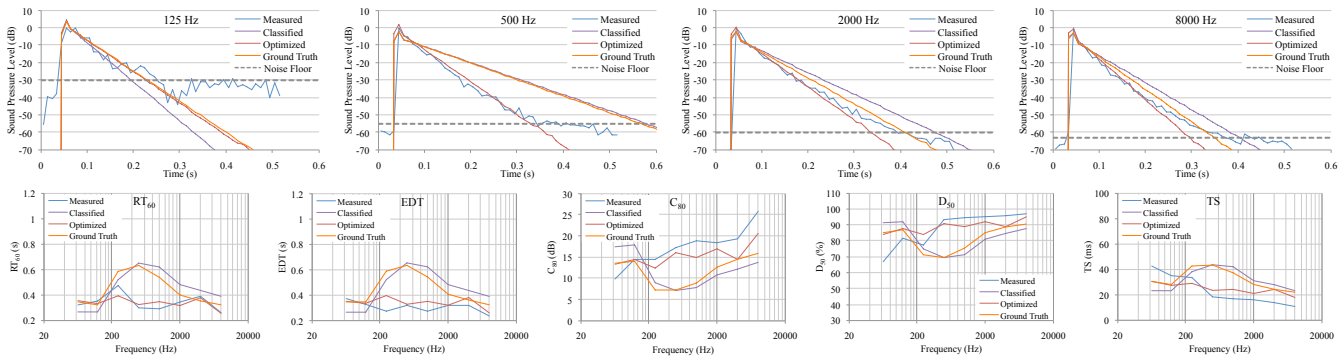


Fig. 2: Results of our optimization approach in the benchmark scenes for alternate impulse responses. We compare the energy-time curves and several standard acoustic parameters for the measured IRs (*measured*) to the results before optimization (*classified*) and the optimized results (*optimized*). We also show the results for manually-segmented materials without optimization (*ground truth*). The energy-time curves are presented for four different octave frequency bands with center frequencies 125Hz, 500Hz, 2000Hz, and 8000Hz. The noise floor corresponds to the signal to noise ratio of the measured IR for each frequency band.