

Supplementary Material: Material Classification using Frequency and Depth Dependent Time-of-Flight Distortion

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1. Additional experimental results

In this supplemental document, additional figures are shown.

Dataset We build a dataset containing 26 materials. Figure 1 shows photographs of 26 objects. The center part of each material is measured.

Confusion matrices Figure 2 shows the confusion matrix using frequency-dependent distortion. Because only three frequencies are available, the accuracy is limited to 57.4%. In this test, measurements at 925mm are extracted from the database and the depth at the frequency #3 is used as the reference. Figure 3 shows the result using depth-dependent distortion. Depths at the frequency #3 are used, and the depth at 925mm is selected as the reference. We additionally use the amount of movement Δd_j from the value of the translation stage for this test. Because a number of depth variations can be used, the accuracy becomes 81.6%. Using both frequency- and depth-dependent distortions, the accuracy is improved to 90.5% as shown in Fig. 4, which is the same as Fig. 5 in the main text.

Real-time demo A video showing the result of the real-time demo system is available on our project site. Please watch it.

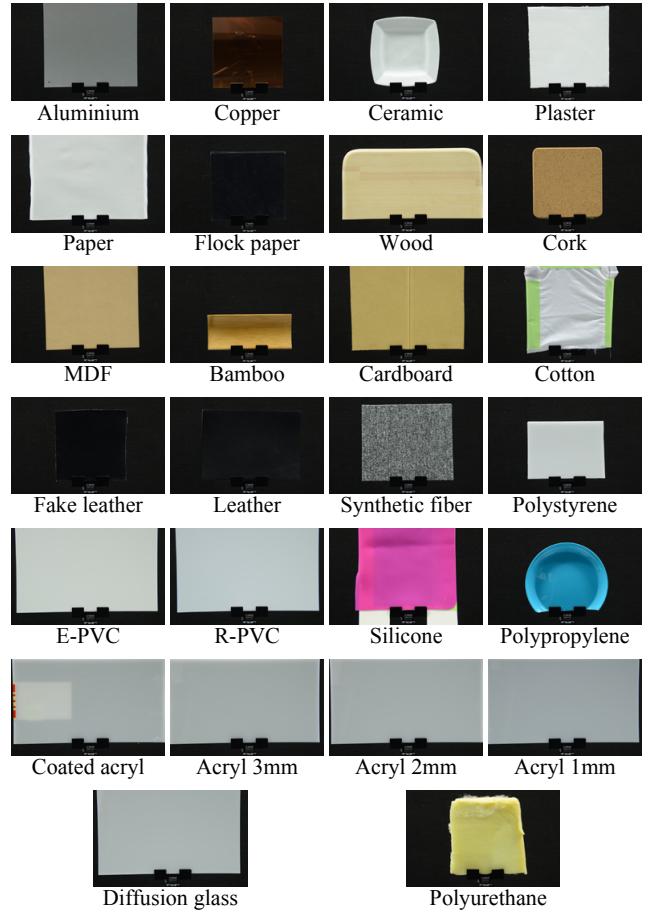


Figure 1: All materials of our database. All images are captured by the same camera parameters *e.g.* ISO, f-number, shutter speed, and focal length.

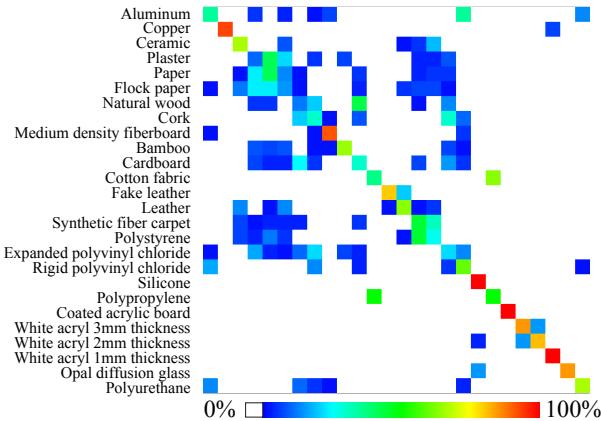


Figure 2: Confusion matrix, where only frequency-dependent distortion is used. The accuracy is 57.4%.

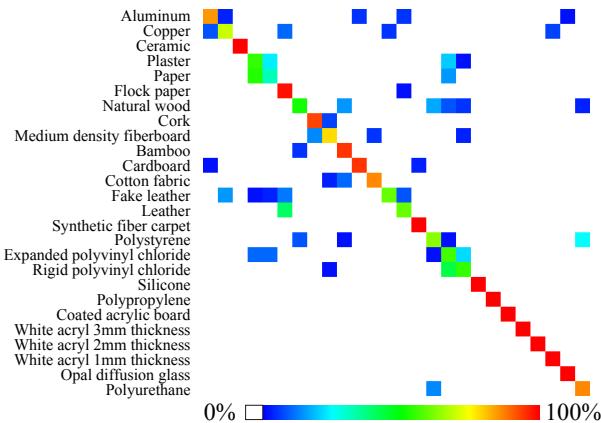


Figure 3: Confusion matrix, where only depth-dependent distortion is used. The accuracy is 81.6%.

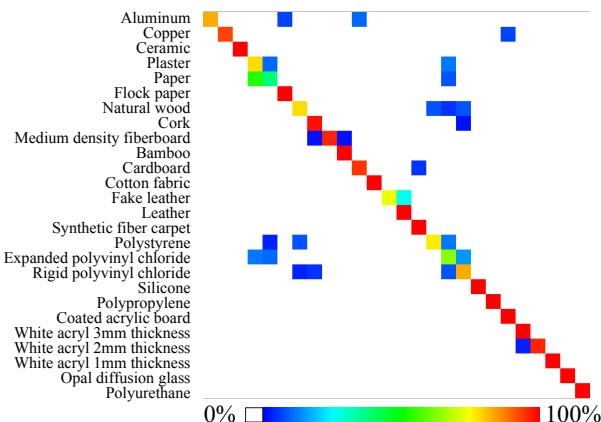


Figure 4: Confusion matrix, where both frequency- and depth-dependent distortions are used. The accuracy is 90.5%. This is the same figure as in the main text.