Deep SVBRDF Estimation on Real Materials

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Paper page: https://lvsn.github.io/real-svbrdf/

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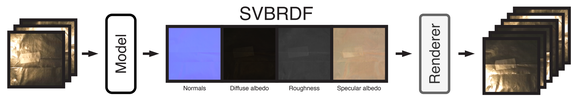
Context

Deep learning approaches can successfully be used to recover accurate estimates of the spatially-varying BRDF (SVBRDF) of a surface from as little as a single image. Most approaches in the literature are trained purely on synthetic data, which is often not representative of the richness of the real world.

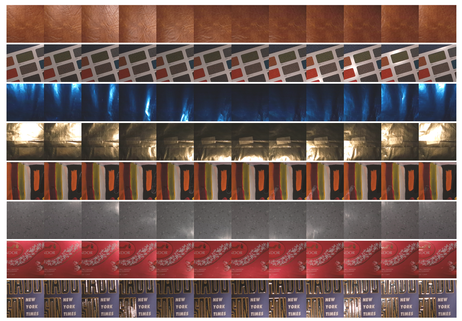
We make the following **contributions**:

- Show that training such networks exclusively on synthetic data is insufficient to achieve adequate results when tested on real data.
- A new dataset of real materials obtained with a novel portable multi-light capture apparatus.
- A novel architecture for SVBRDF estimation.

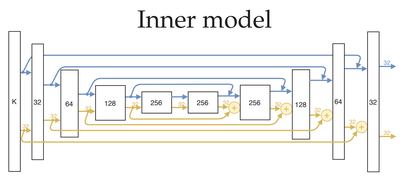


Real materials dataset

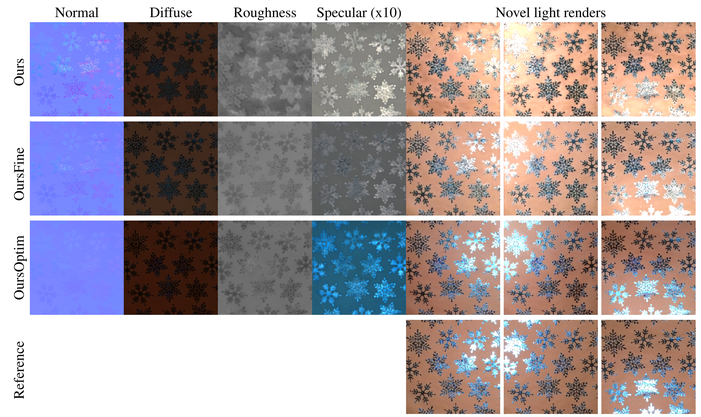
- 80 Real-world materials captured in a dark room.
- Each captured set includes 12 RGB-D images.
- In total, 462 image sets (combinations of light intensities,distances to the camera, and material sample).

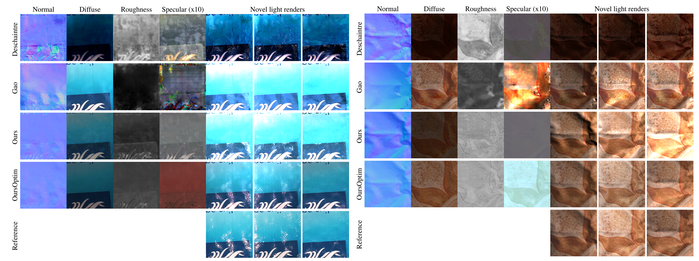


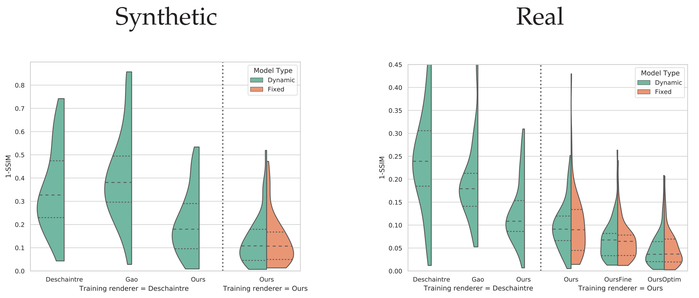
Architecture



Results

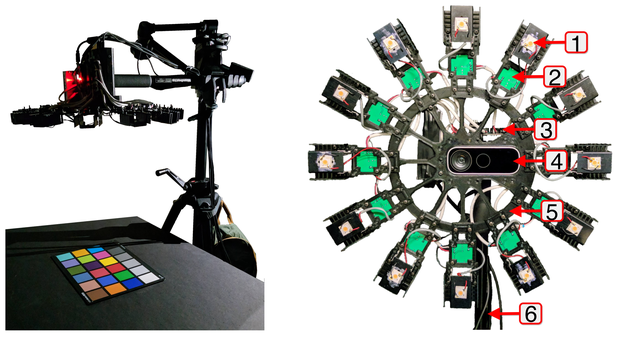






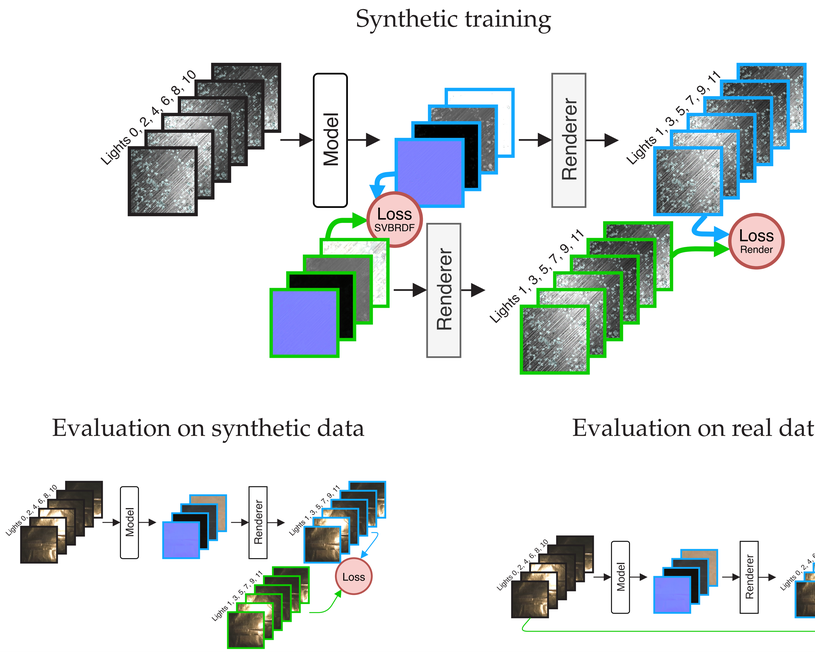
Capture system

A portable and convenient multi-light capture system is used to capture real world materials. The system is calibrated with a X-Rite ColorChecker and a photographer grey card.



1. LED
2. Primary light controller
3. Kinect Azure (RGB-D)
4. Secondary controller
5. 3D printed frame
6. Portable tripod

Method



Acknowledgements

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