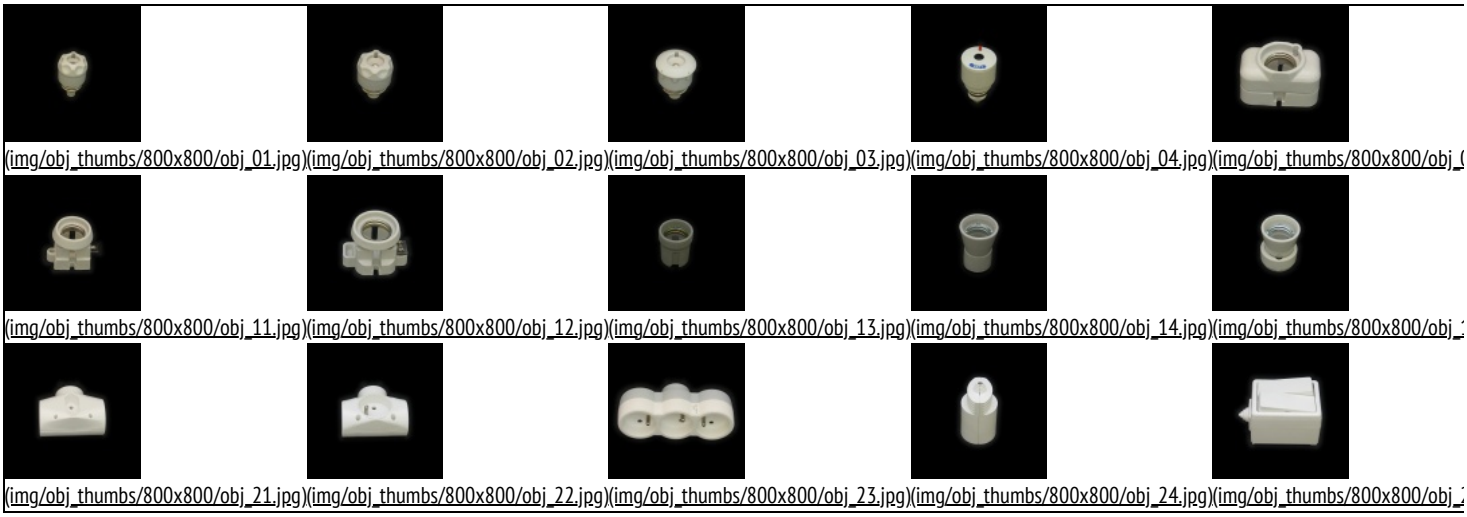
An RGB-D dataset and evaluation methodology for detection and 6D pose estimation of texture-less objects

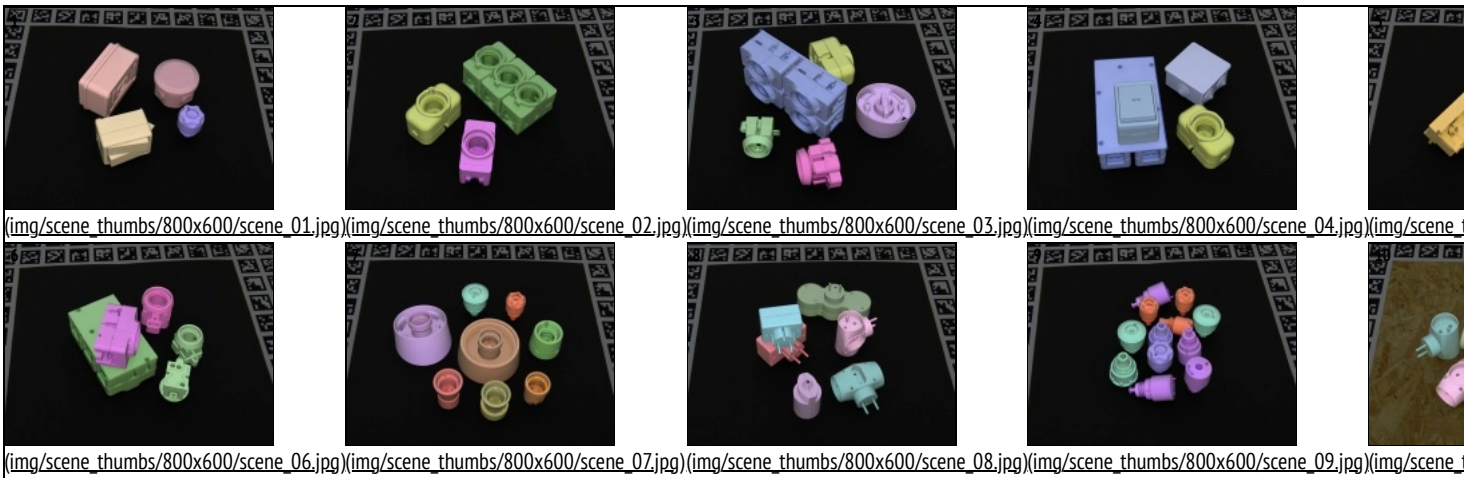
- **30 industry-relevant objects**: no discriminative color, no texture, often similar in shape, some objects are parts of others.
- **Three synchronized sensors** used to capture the training and test images: Primesense CARMINE 1.09 (a structured-light RGB-D sensor), Microsoft Kinect v2 (a time-of-flight RGB-D sensor), and Canon IXUS 950 IS (a high-resolution RGB camera).
- **Training images (38K from each sensor)** depict individual objects against a black background.
- **Test images (10K from each sensor)** originate from 20 test scenes. The scene complexity varies from simple scenes with several isolated objects to very challenging ones with multiple object instances and a high amount of clutter and occlusion.
- **Two types of 3D models for each object**: a manually created CAD model and a semi-automatically reconstructed one.
- **A new evaluation methodology (evaluation.html)** which deals with pose ambiguity that can be caused by object symmetries and occlusions.

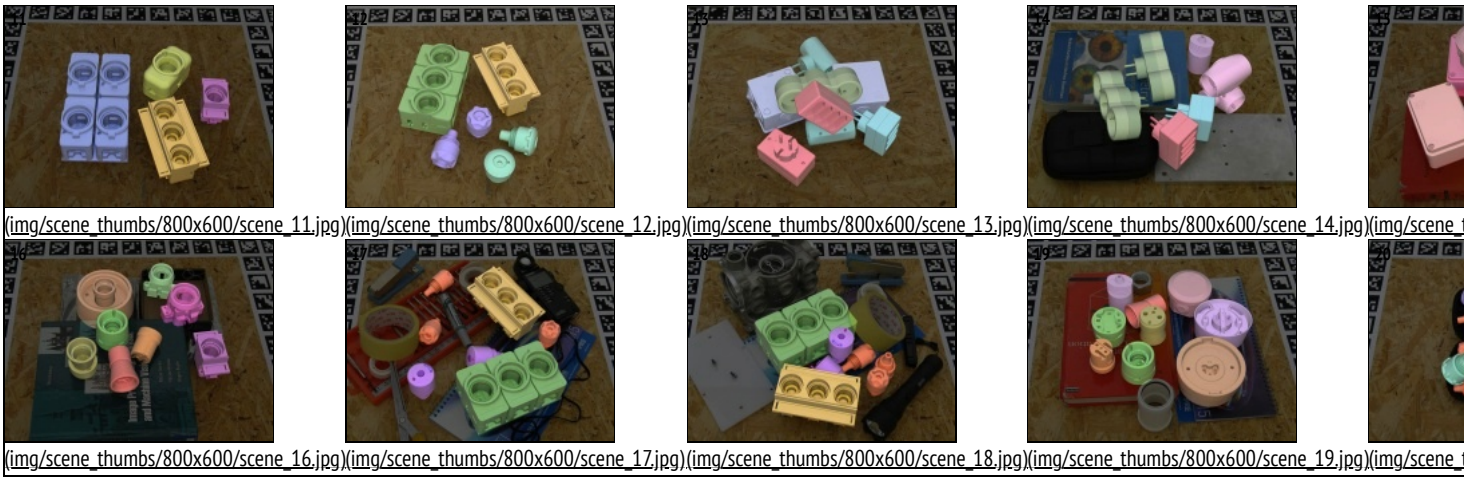
T. Hodaň, P. Haluza, Š. Obdržálek, J. Matas, M. Lourakis, X. Zabulis,
T-LESS: An RGB-D Dataset for 6D Pose Estimation of Texture-less Objects,
IEEE Winter Conference on Applications of Computer Vision (WACV), 2017, Santa Rosa, USA
[PDF (http://cmp.felk.cvut.cz/~hodanto2/data/hodan2017tless.pdf), SLIDES (http://cmp.felk.cvut.cz/~hodanto2/data/hodan2017tless_slides_wacv.pdf), POSTER (http://cmp.felk.cvut.cz/~hodanto2/data/hodan2017tless_poster.pdf), BIB (http://cmp.felk.cvut.cz/~hodanto2/data/hodan2017tless.bib)]

- **05/Jun/2020** - New photorealistic training images (https://bop.felk.cvut.cz/datasets/#T-LESS) generated by BlenderProc4BOP (https://github.com/DLR-RM/BlenderProc/blob/master/README_BlenderProc4BOP.md) for the BOP Challenge 2020 (https://bop.felk.cvut.cz/challenges/bop-challenge-2020/).
- **03/Jul/2018** - T-LESS included in the BOP benchmark for 6D object pose estimation (https://bop.felk.cvut.cz/).
- **06/May/2017** - T-LESS included in the SIXD challenge 2017 (http://cmp.felk.cvut.cz/sixd/challenge_2017/).
- **28/Mar/2017** - T-LESS presented at WACV 2017 in Santa Rosa.
- **19/Jan/2017** - A paper about T-LESS is available on arXiv (https://arxiv.org/pdf/1701.05498v1.pdf).
- **23/Sep/2016** - The first complete version (v2) of the dataset is released.
- **16/Mar/2015** - A preview version (v1) of the dataset is available.



Objects included in the dataset. Each object is captured from a systematically sampled view sphere - with 10° step in elevation (from 85° to -85°) and 5° step in azimuth.





Sample test images. The images are overlaid with colored 3D object models at the ground truth poses. Each test scene is captured from a systematically sampled view hemisphere - with 10° step in elevation (from 75° to 15°) and 5° step in azimuth.