

## Surface prediction for a single image of urban scenes

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### Abstract

© 2015, Springer International Publishing Switzerland. In the paper we present a novel method for three-dimensional scene recovering from one image of a man-made environment. We use image segmentation and perspective cues such as parallel lines in space. The algorithm models a scene as a composition of surfaces (or planes) which belong to their vanishing points. The main idea is that we exploit obtained planes to recover neighbor surfaces. Unlike previous approaches which use one base plane to place reconstructed objects on it, we show that our method recovers objects that lie on different levels of a scene. Furthermore, we show that our technique improves results of other methods. For evaluation we have manually labeled two publicly available datasets. On those datasets we demonstrate the ability of our algorithm to recover scene surfaces in different conditions and show several examples of plausible scene reconstruction.

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