Goal  Given an input image, this project focuses on removing a selected object from the image while in-paint the removed region so as to keep the image realistic. A possible extension will be to also complete depth information on the removed region.

Description  In contrast to augmented reality, this project aims to remove objects from the target scene. This increases the flexibility in many applications. For example, we want to change the layout of a classroom, with this technique, we can remove all the tables and replace them with totally different ones. Moreover, if depth information is available, this project aims to also complete the removed depth information so that the depth map is complete and can be used for detecting collision and applying animations.

This project consists of three steps:

1. Detect an object and its region on the input image.
2. Remove and in-paint the removed region.
3. If a depth map is available, complete or predicts depth information.

Here is one possible solution for this project:
• Using a object detection network to identifying object (e.g. Mask-RCNN[2], YOLO[3])
• Using a image in-painting network to recover the missing region (e.g. FreeForm [4]).
• Using a depth completion network [5] or depth prediction network [1] to get a complete depth information.

Requirements

• Basic knowledge in Pytorch (or Tensorflow)
• Basic knowledge in Python
• Basic knowledge in C++

References


