一种基于生成式对抗网络的草图补全与识别方法
# SketchGAN: Joint Sketch Completion and Recognition with Generative Adversarial Network

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Abstract

Hand-drawn sketch recognition is a fundamental problem in computer vision. Previous methods often assume that a complete sketch is used as input; however, hand-drawn sketches in common application scenarios are often incomplete, which makes sketch recognition a challenging problem. We propose SketchGAN, a new generative adversarial network (GAN) based approach that jointly completes and recognizes a sketch, boosting the performance of both tasks.
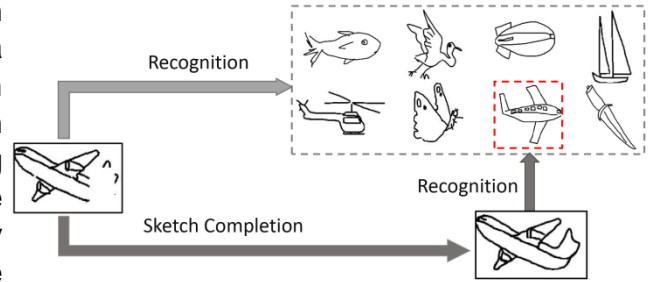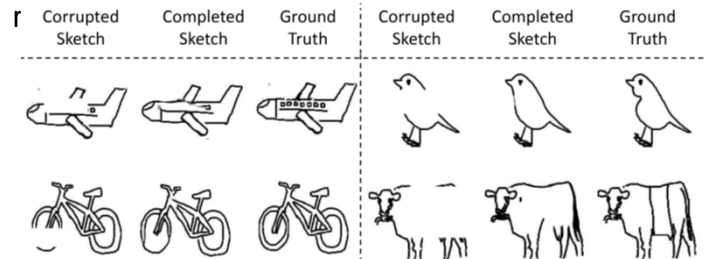
Challenge

Hand-drawn sketches lack color and contextual information, and are generally known to be more ambiguous than natural images.
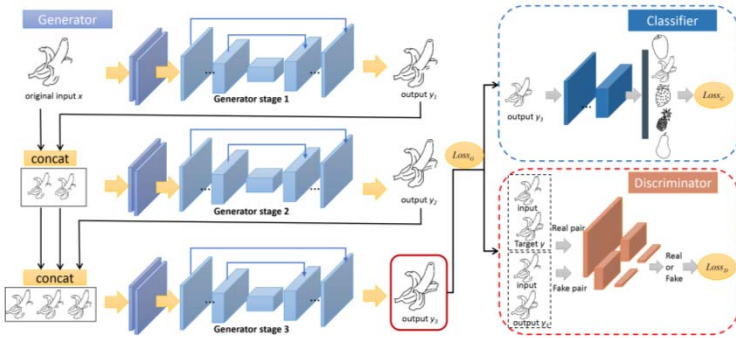
Results

Experiments on the Sketchy database benchmark:

- SketchGAN performs well with all the125 object categories, with 75.62% precision and 52.07% r

Examples of sketch completion.

Methods

Our proposed framework focuses on **two aspects**:

① The reuse of the previous sketch completion outputs--**cascade strategy;**
② Improving the sketch completion when multi-class objects exist--**adopt a sketch recognition network as an auxiliary network for sketch. completion.**
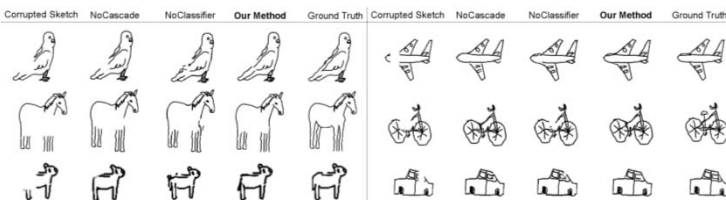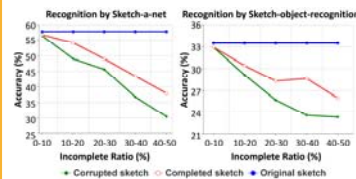

Comparison of different combinations of components in our method.
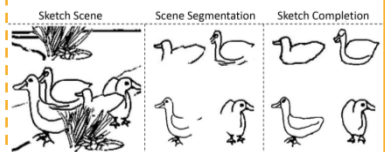
Applications

- Incomplete Sketch Recognition.

Using our sketch completion method as an intermediate step of the incomplete sketch recognition task.

Improvement of sketch recognition rates with respect to the incomplete ratio of sketches. The sketch recognition methods used here are Sketch-a-net and Sketch-object-recognition, respectively.

- Sketch Editing.

Hand-drawn sketches are usually incomplete in scenarios such as overlapping sketches for a scene with multiple objects, interim sketches, or corrupted sketches due to image segmentation.

Sketch editing. With sketch completion as a key step, we can handle post sketching applications more easily, including sketch reorganization, colorization, SBIR, sketch based image generation, etc.