**Motivation & Contribution**

- Sketch understanding is important and has lots of applications in computer vision and graphics;
- Most existing sketch datasets and sketch tasks are at stroke- or object-level;
- Scene sketch understanding leads to a deeper and richer reasoning about sketched visual forms.
- **The first large-scale dataset of scene sketches**, termed SketchyScene, is introduced.

![SketchyScene: Data Collection](https://github.com/SketchyScene/SketchyScene)

**SketchyScene: Data Collection**

**Step1: Data Preparation**
- Object sketches from 45 categories are collected.

**Step2: Scene Sketch Synthesis**
- 7,264 scene templates are synthesized by a customary, web-based application – USketch (Fig. 1).

**Step3: Annotation and Data Augmentation**
- More scene sketches are generated by replacing the object sketches with the rest components.

![SketchyScene: Dataset Statistics](https://github.com/SketchyScene/SketchyScene)

**SketchyScene: Dataset Statistics**

- **7,264** unique scene templates. Each contains at least 3 object instances;
- On average there are **16** instances, 6 object classes, and 7 occluded instances per template;
- **29,056** scene sketches after data augmentation;
- **11,316** object sketches spanning **44** categories;
- **4,730** unique reference cartoon style images;
- **100%** accurate semantic-level and instance-level segmentation annotations.

**SketchyScene can be further augmented:**
Object sketches can be replaced by sketches from other resources.

![Sketch Scene Segmentation](https://github.com/SketchyScene/SketchyScene)

**Sketch Scene Segmentation**

**Problem Definition**

The problem of semantic segmentation in scene sketches is defined as predicting a class label for each pixel whose value is 0 since only black pixels convey semantic information.

**Challenges**

- Classes are imbalanced, i.e., large blank areas;
- Occluded objects are hard to segment due to lack of visual cues.

**Key** – ignore background class during modeling.

**Quantitative results:**

![Applications](https://github.com/SketchyScene/SketchyScene)

**Applications**

- Scene-level image retrieval;
- Sketch captioning and editing;
- Dynamic scene synthesis.

![Examples of applications](https://github.com/SketchyScene/SketchyScene)

**Examples of applications.**