

Data Collection & Analysis

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Gameplay Images Dataset [Kidus]

The Gameplay Images dataset was sourced from [Kaggle](#). It has 1,000 images from **10 different games**, such as Minecraft or Fortnite, adding up to **10,000 images total**. All images are in **.png** format and are **640x360** in resolution. See [notebook](#) for details.

Pros

- Images are from popular, well-known video games
- Images are all consistently formatted and structured (.png, 640x360p)
- Images are from a variety of scenes and genres of games
- Could be useful to learn many novel scenes and images

Cons

- Images are only provided in low-resolution — there is no high-resolution counterpart or ground truth to compare predictions to.
- The images are screenshots from YouTube videos as opposed to video game engines

QRISP Dataset [Samantha]

Qualcomm Rasterized Images for Super-resolution Processing, or QRISP, was sourced from [Qualcomm](#). It has frame-by-frame images from **13 different scenes** in varying resolutions: **270p, 360p, 540p, and 1080p** for a total of **58,080 images in the training set** and **12,000 in the test set**. See [notebook](#) for details.

Pros

- The dataset is very large and is already split into train/test with a nice 83/17 split
- The dataset is very consistent and has the same scenes in varying resolutions, useful for comparing a low res image to a high res image
- Interesting image transformation variants e.g., mipmap biasing and viewpoint jittering
- Interesting metadata for each image, such as the game engine's camera angle

Cons

- Heavily nested file structure; difficult to navigate for data loading and modeling
- Images are frame-by-frame, very little variety when viewed sequentially; need to shuffle
- The image transformation variants may not be useful for our current task

SRGD Dataset [Eric]

The Super Resolution Gaming dataset (SRGD) is fully hosted on [Hugging Face](#) and [GitHub](#). Additionally, a pre-processed version for the SRGD competition (train/test split and shuffled) is available on [Kaggle](#). This dataset contains **270p, 360p, 540p, and 1080p** images across various resolutions. Images are grouped by games/projects and then resolutions. Similar to QRISP, the images may seem sequential or frame by frame in nature. The Kaggle variant addresses this, appropriately shuffling data from all games and creating a train/test for low-res (270p) and high-res (1080p) images—this helps us tremendously with preprocessing the data.

The train set is **14,431 images** and the test set is **3,600 images**. However, the test set does not have high-res variants, so we do not have a ground truth. Thus, we can simply decompose the train set into a train, validation, and test set. See [notebook](#) for details. We have pushed the **train/val/test splits (70/15/15%)** to [Hugging Face](#) for easy imports and reproducibility.

Pros

- Varying resolutions allows us to explore multiple possibilities and have ground truths of low-res and high-res across the same image.
- Includes a blend of real game e.g., Dota 2 and CSGO, combined with game projects
- Dataset is already preprocessed and shuffled on Kaggle — we can use this very easily
- All of the images are in .png and consistently indexed across low-res and high-res
- The dataset was sourced and created with the intent of super-resolution (our task)

Cons

- Much of the dataset is in the Unity game engine, so the model may perform weaker on games made using other game engines or with unique art styles
- The original SRGD dataset is extremely large, hard to process, and a bit difficult to navigate through without doing some research
- The original Hugging Face dataset repo fails to import; seems like config file is bugged

Conclusion

We are moving forward with the **SRGD dataset** to develop our models. The dataset is the most consistent, no-frills choice amongst all three of the datasets; **the “goldilocks” dataset**. It has a variety of gameplay scenes and was developed with the task of video game super-resolution in mind, making it a natural choice. It is also preprocessed and shuffled—the only preprocessing we need to do is split the “train set” into train/val/test sets and push it to Hugging Face.

However, we do not want to discredit the other datasets—they each have their own merit and may prove useful for our overall project. The Gameplay Images dataset could be useful and fun for a live in-class demo and to test our models on newer, modern games. The QRISP dataset could be used to extend our model to a frame-by-frame approach, truly like Nvidia’s DLSS.