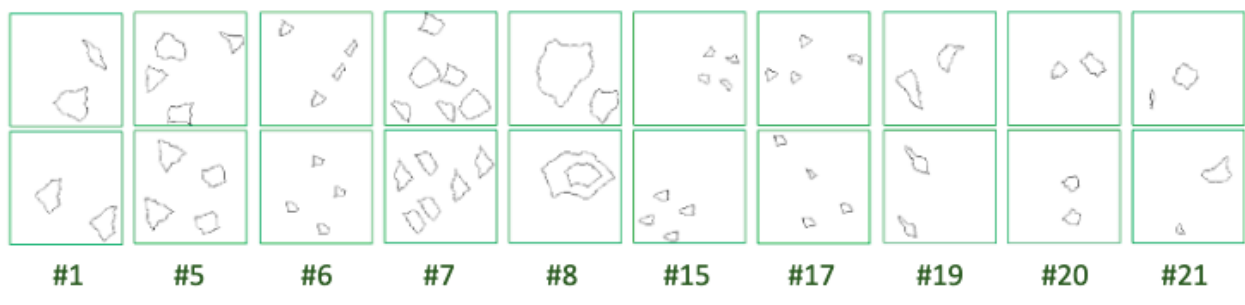


Machine Learning Assignment 2

Solving Synthetic Visual Reasoning Test (SVRT) with Few-shot Learning Algorithms

This series of SVRT problems were developed to assess the performance of machine-learning techniques for vision. They are designed to require more than local descriptors and simple statistics of the image to be solved properly. <http://www.idiap.ch/~fleuret/svrt/>

SVRT SD problems# 1, 5, 6, 7, 8, 15, 17, 19, 20, 21, and 22 involve comparing shapes. An agent has to be able to decide whether two shapes are similar or not at one stage of the classification process.

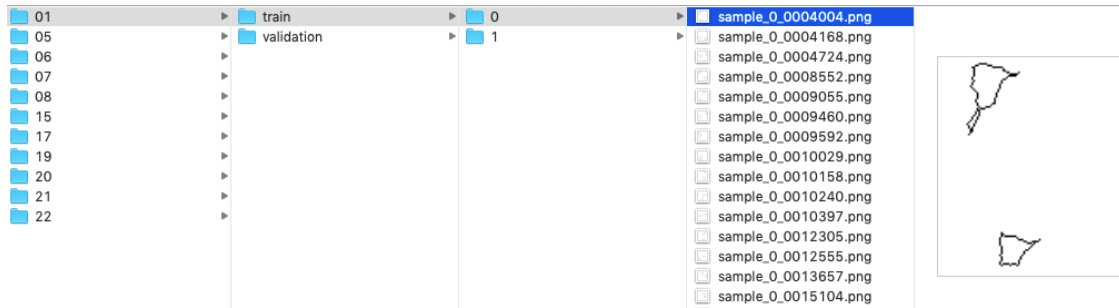


Previous studies show that the 'same-different'(SD) problems from SVRT are very challenging to solve through supervised learning, on the contrary, humans are easy to detect certain abstract features by observing only a few samples.

<[25 years of CNNs: Can we compare to human abstraction capabilities?](#)(2016)>

<[NOT-SO-CLEVR: VISUAL RELATIONS STRAIN FEEDFORWARD NEURAL NETWORKS](#)(2018)>

In this assignment, we have prepared all SD problems data as bellowed folder structure:



For each problem, the 'train' folder consists of 100 samples for each class(**0-different, 1-same**), and you are able to explore and train any proper model only using these samples; the 'validation' folder consists of 10000 samples for each class that should be used to verify your model's solving performance.

Your work will be assessed based on:

1. The depth of your exploration on few-shot learning algorithms and the effort of the implementation
2. The average performance ranking of solving all SD problems
(1st award 600 RMB; 2nd award 400 RMB)

What You Will Submit:

Due: June. 8th, 2019

A jupyter notebook file, with the name format **Assign2_name.ipynb**, should consist of organized instruction for each step, and your coding work in different cells with the program running outputs.