

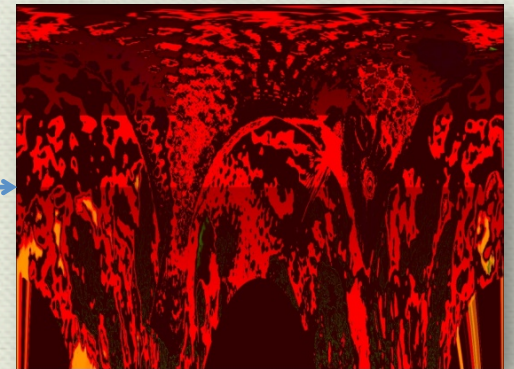
David Norton, Derrall Heath and Dan Ventura
Computer Science Department
Brigham Young University

Autonomously Managing
Competing Objectives to
Improve the Creation
and Curation of Artifacts

DARCI

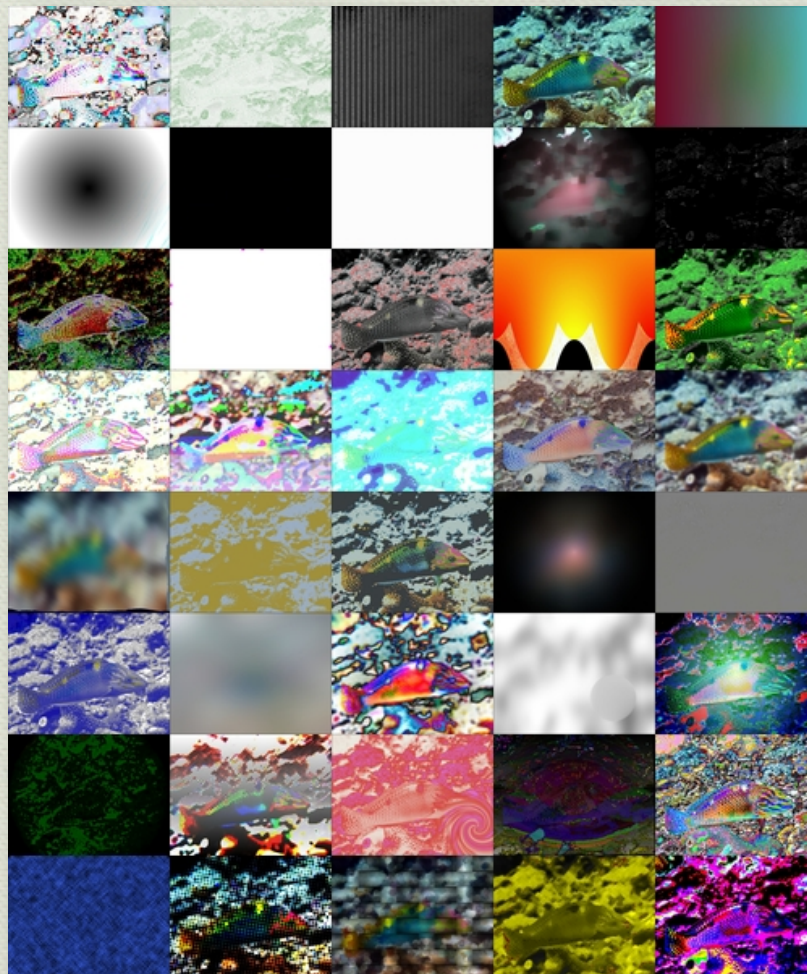


Image
Renderer



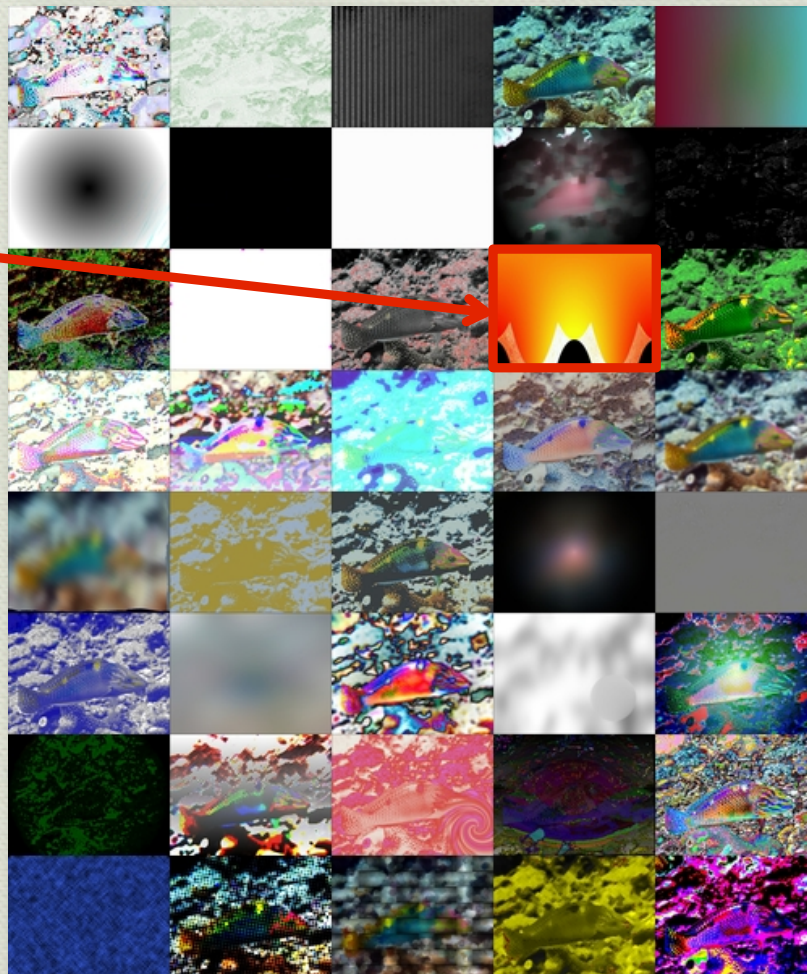
fiery

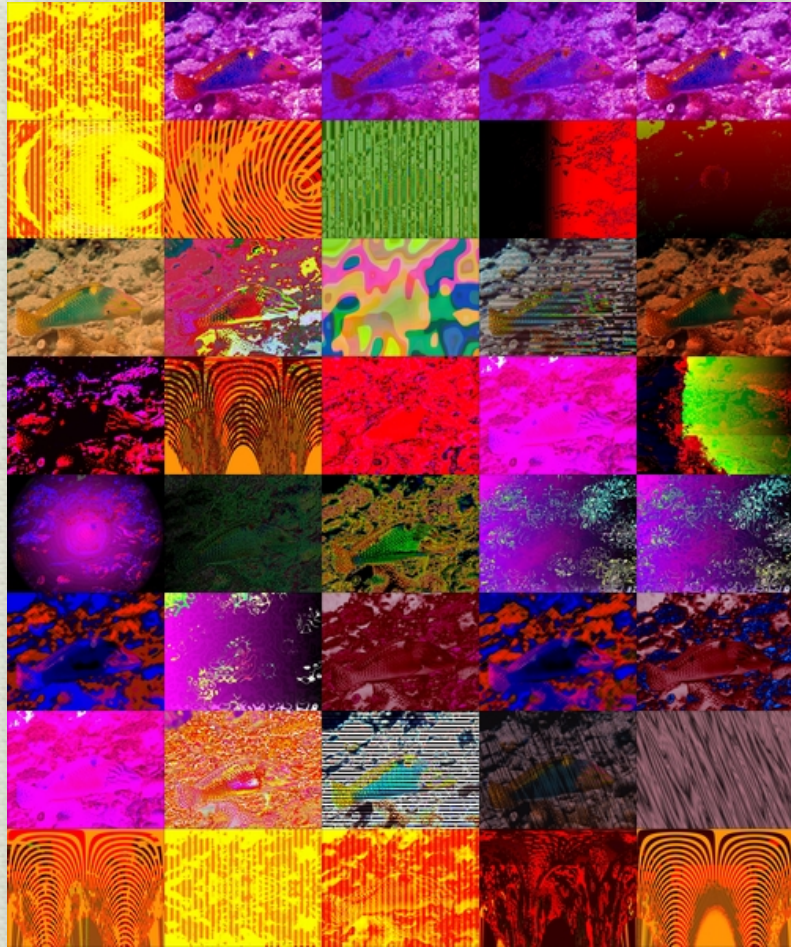
Created Randomly



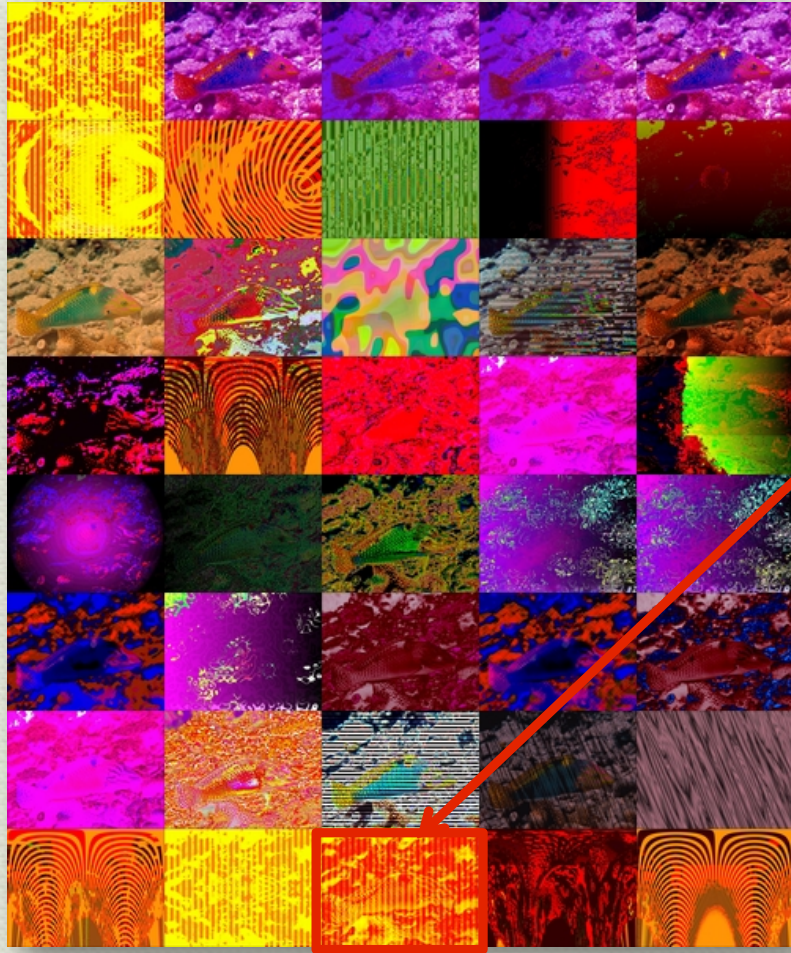
Created Randomly

Chosen by Human



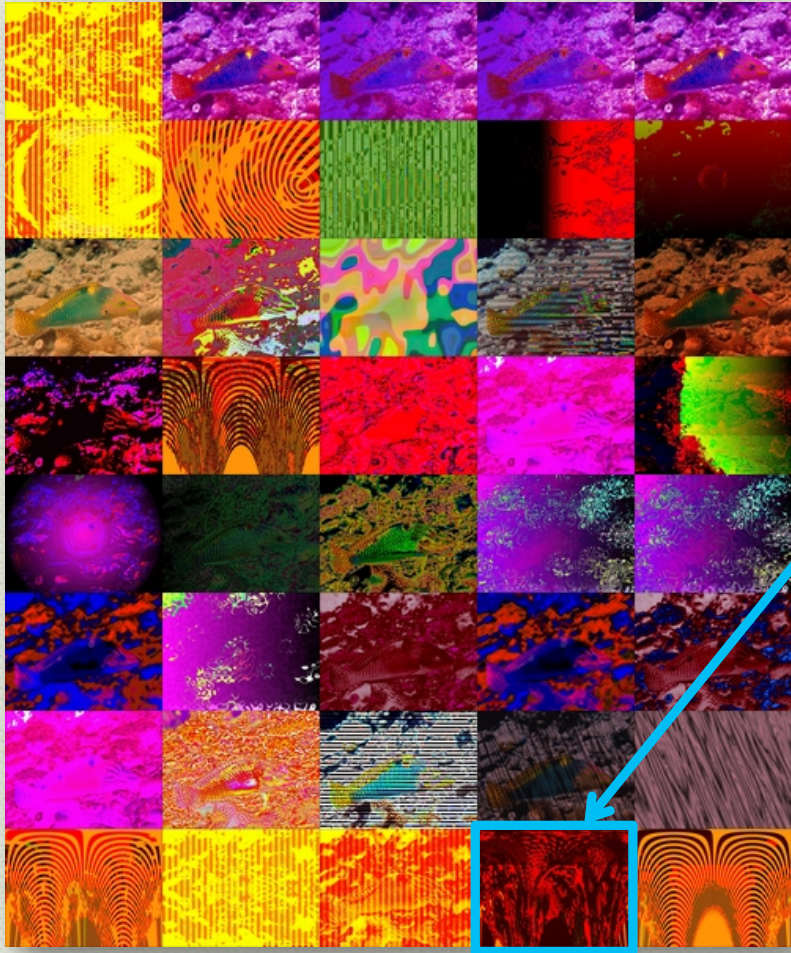


Created by System



Created by System

Chosen by Human



Created by System

Chosen by System

Generative Mechanism

Source Image

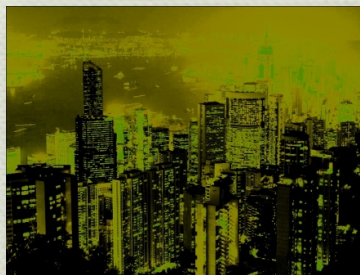


Genotype

RGB Adjust	0.82	0.43	0.45	RGB Adjust	0.80	0.49	0.13	HSB Adjust	0.42	0.83	0.28
------------	------	------	------	------------	------	------	------	------------	------	------	------



Phenotype



Fitness
Function



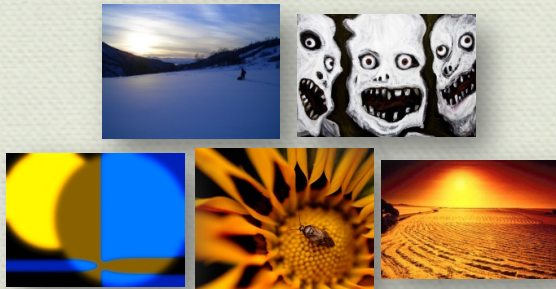
0.71

Adjective Matching Metric

Current Positive Examples



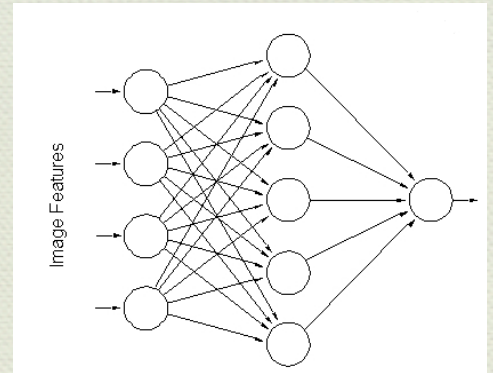
Current Negative Examples



$$P(\text{rank}(d)) = \frac{\text{rank}(d)}{\sum_{i=0}^{|D_{as}|} i}$$

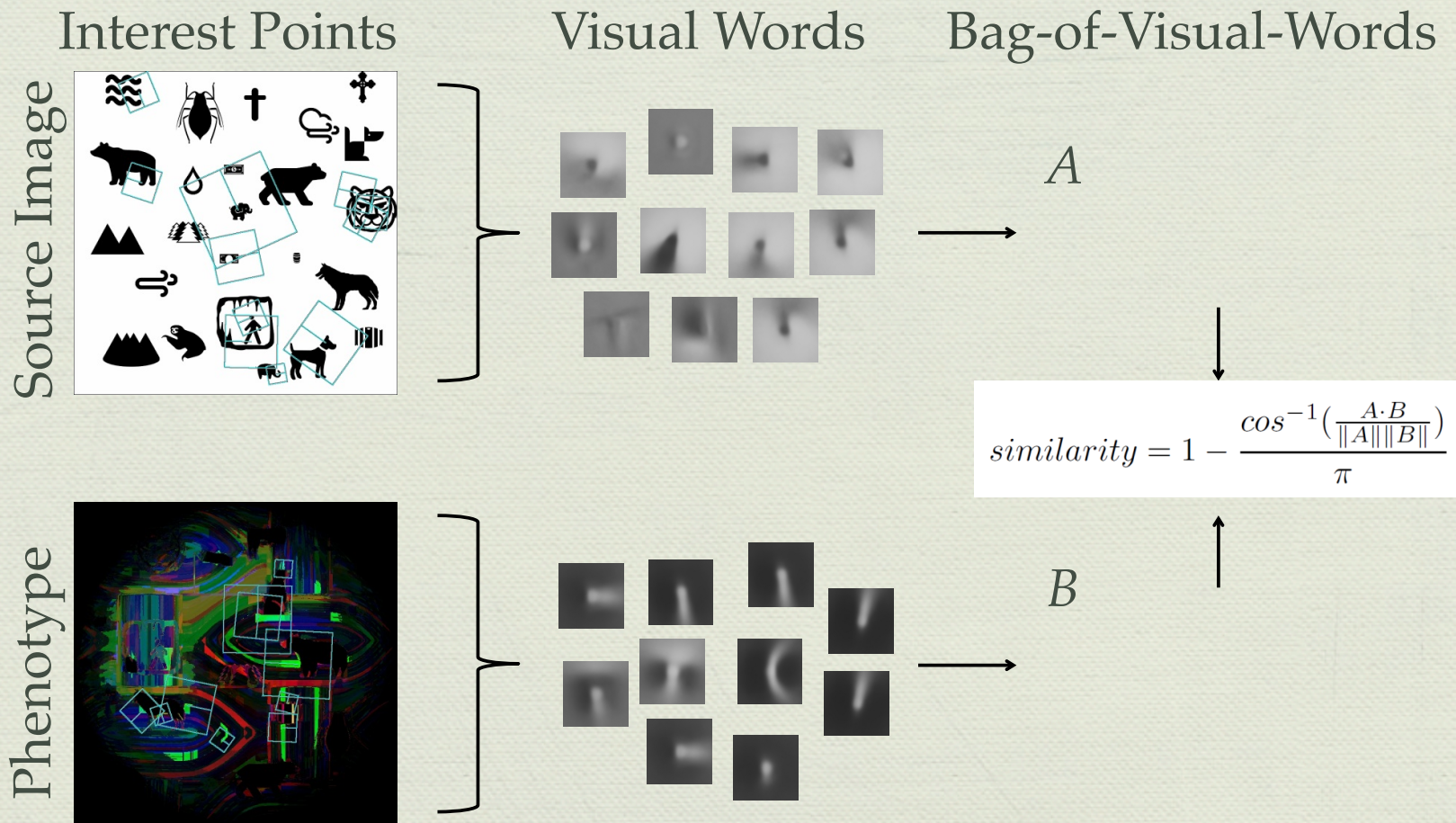


Fiery



Training Set

Similarity Metric

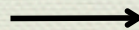


Similarity Fitness Function

Similarity Metric



0.84



0.84

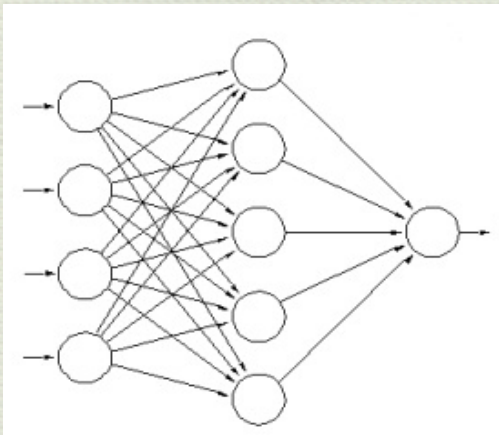


Adjective Fitness Function

Adjective Matching Metric

Fiery

Image Features



0.76 → 0.76

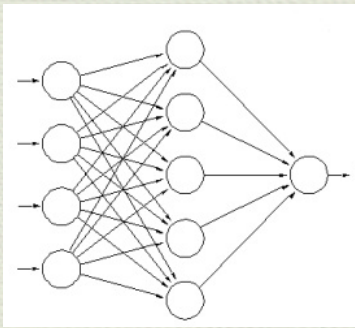


Average Fitness Function



0.84

Image Features



Fiery

0.76

0.80

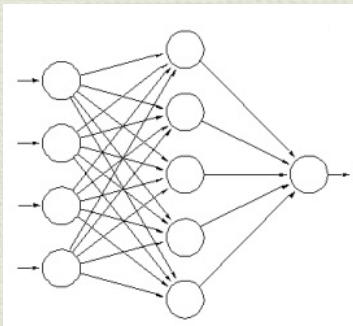


Minimum Fitness Function



0.84

Image Features



Fiery

0.76

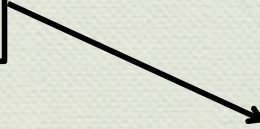
0.76



Alternate Fitness Function



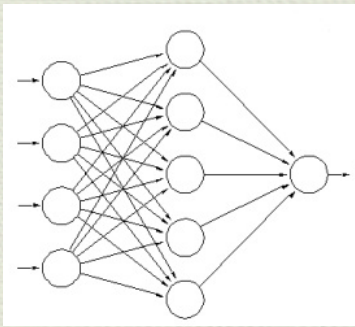
0.84



0.84



Image Features

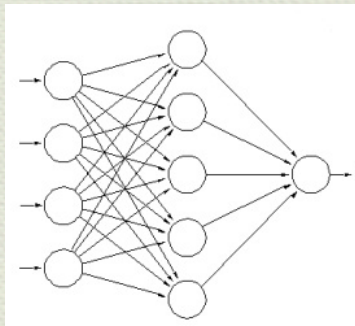


Fiery

Alternate Fitness Function



Image Features



Fiery

0.76

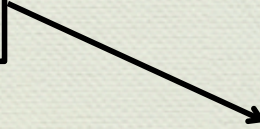
0.76



Converge Fitness Function



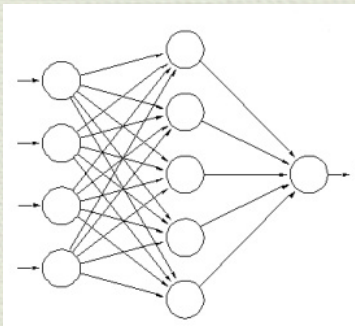
0.84



0.84



Image Features



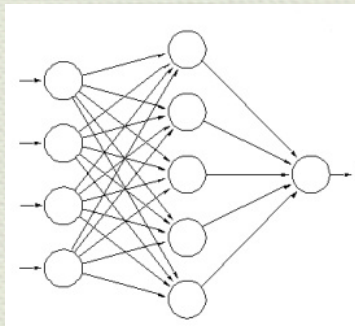
Fiery

Converge Fitness Function



20 Generations

Image Features



Fiery

Converge Fitness Function

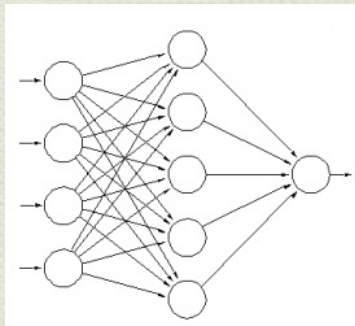


Image Features

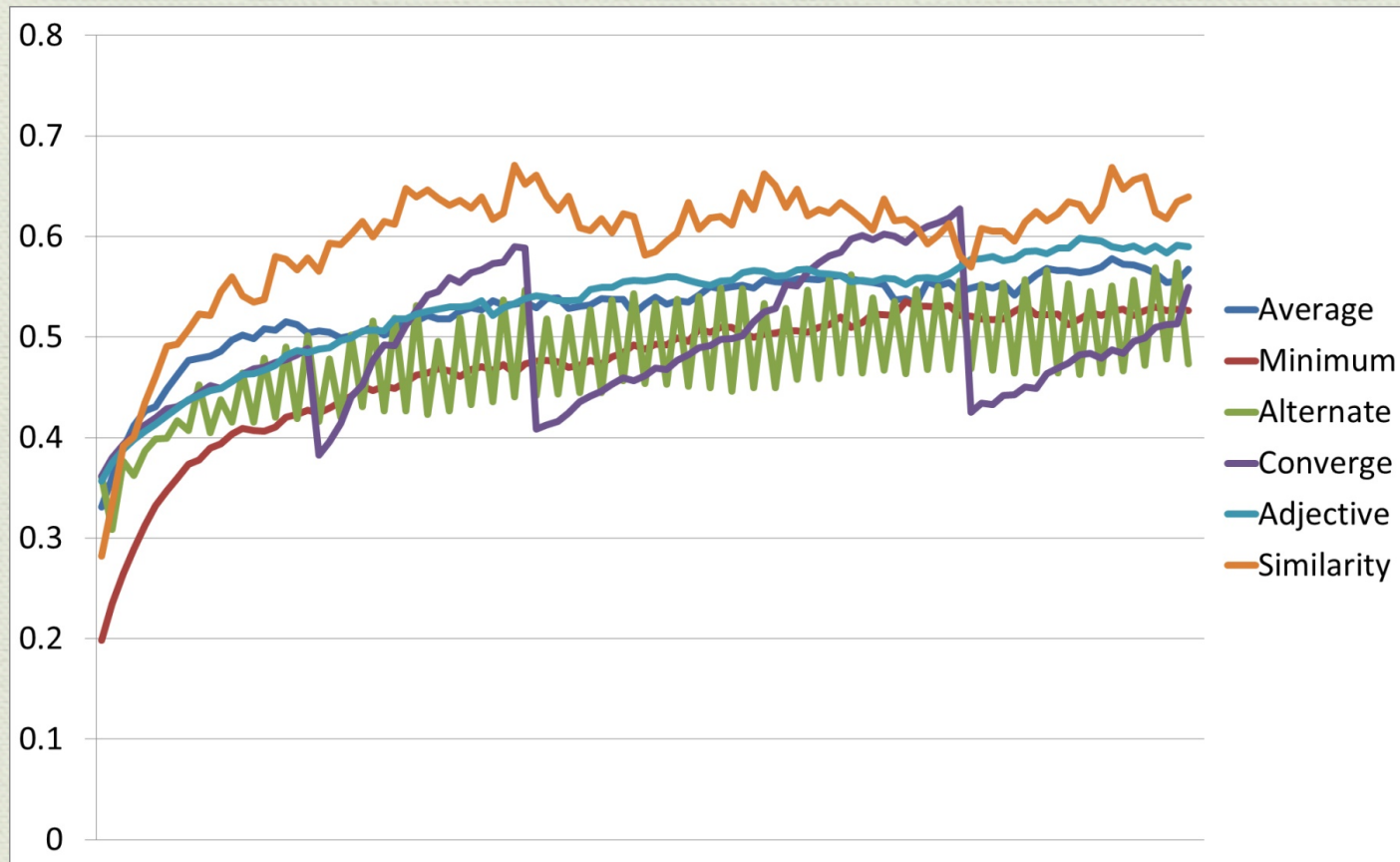
Fiery

0.76

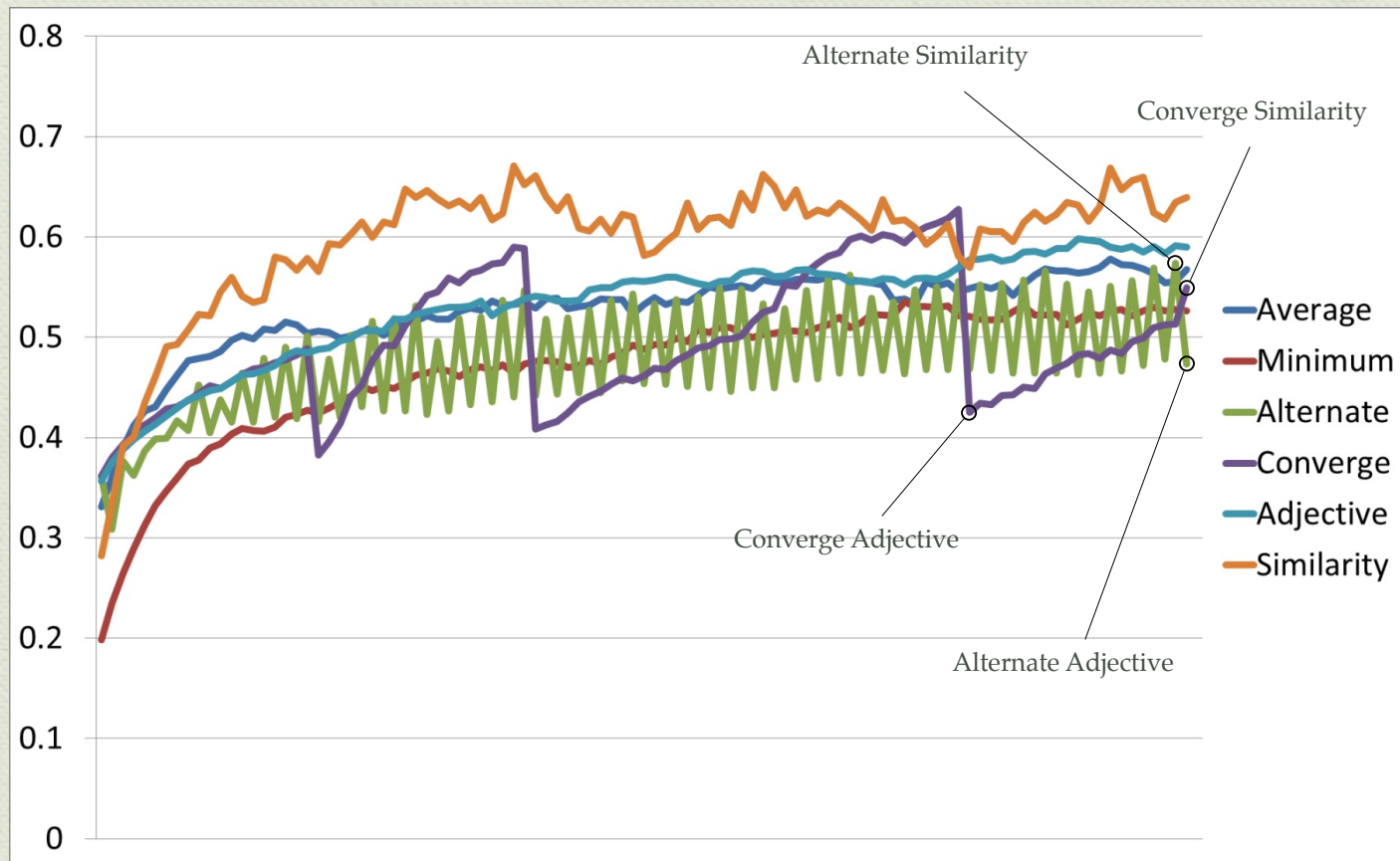
0.76



Fitness Functions



Fitness Functions



Source Images



Image A



Image B



Image C

Similarity Fitness Function



Image A



Image B



Image C



Image A

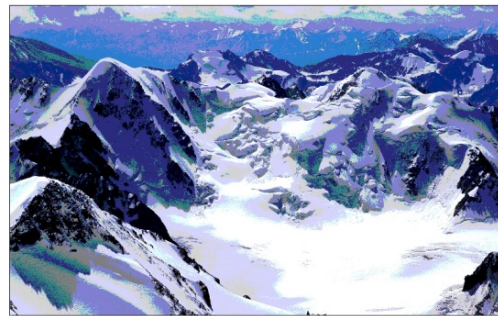
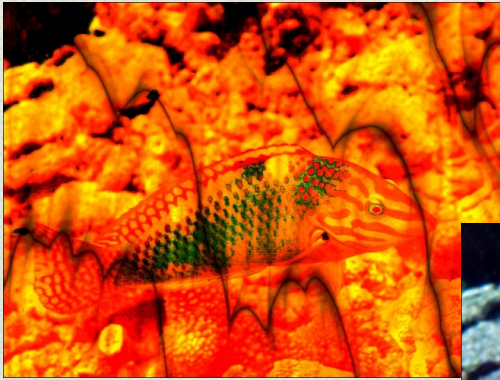


Image B

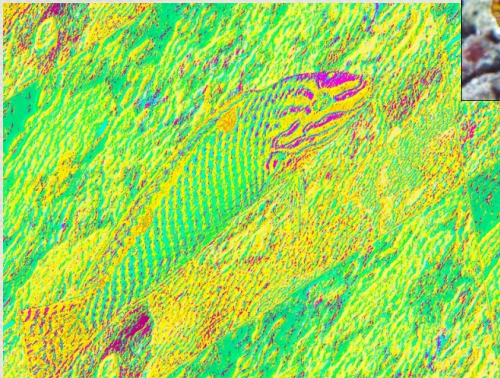


Image C

Success vs. Failure



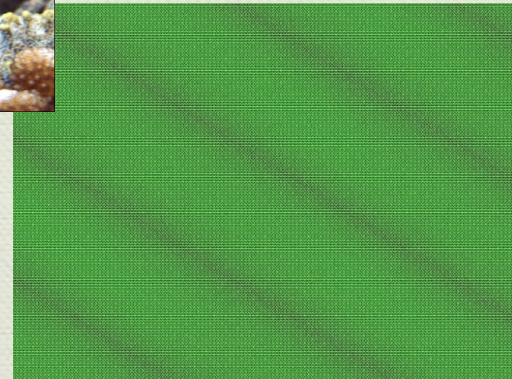
Successes



Interest



Failures



Success vs. Failure



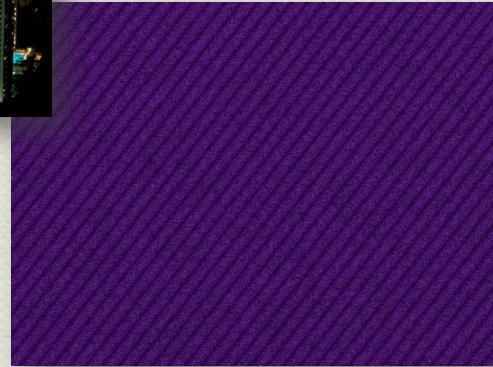
Successes



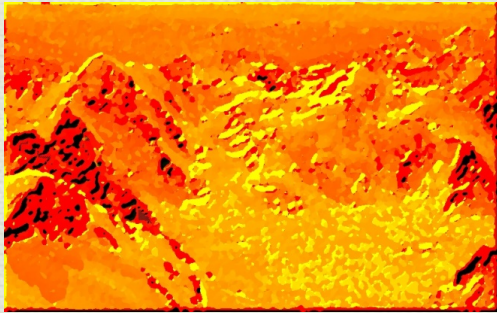
Interest



Failures



Success vs. Failure

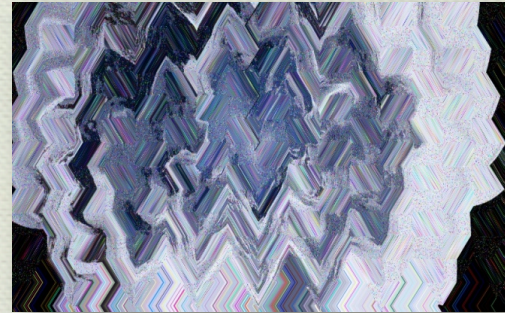


Successes

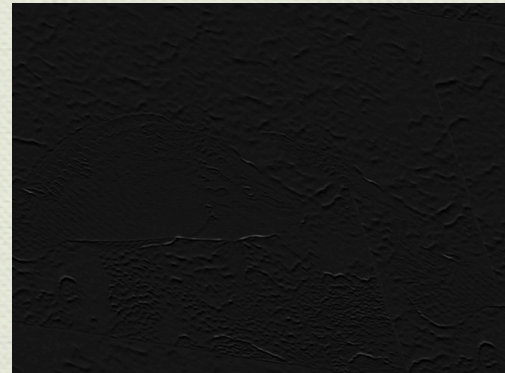


Adjective
Matching

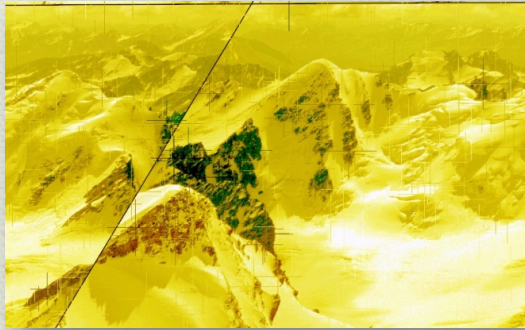
Fiery



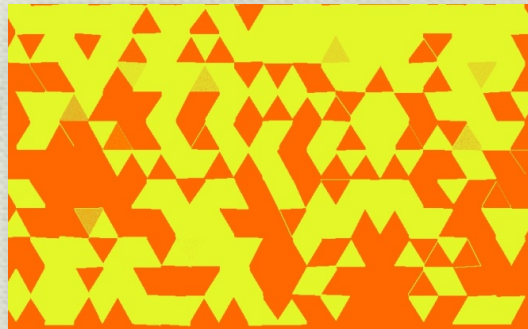
Failures



Success vs. Failure

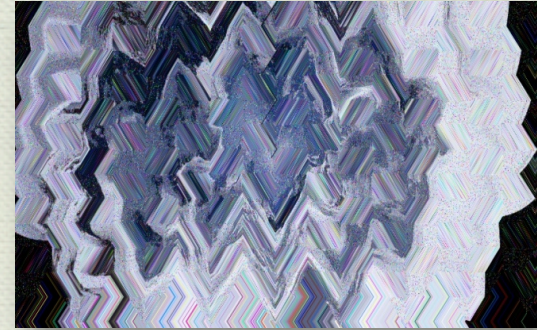


Successes



Adjective
Matching

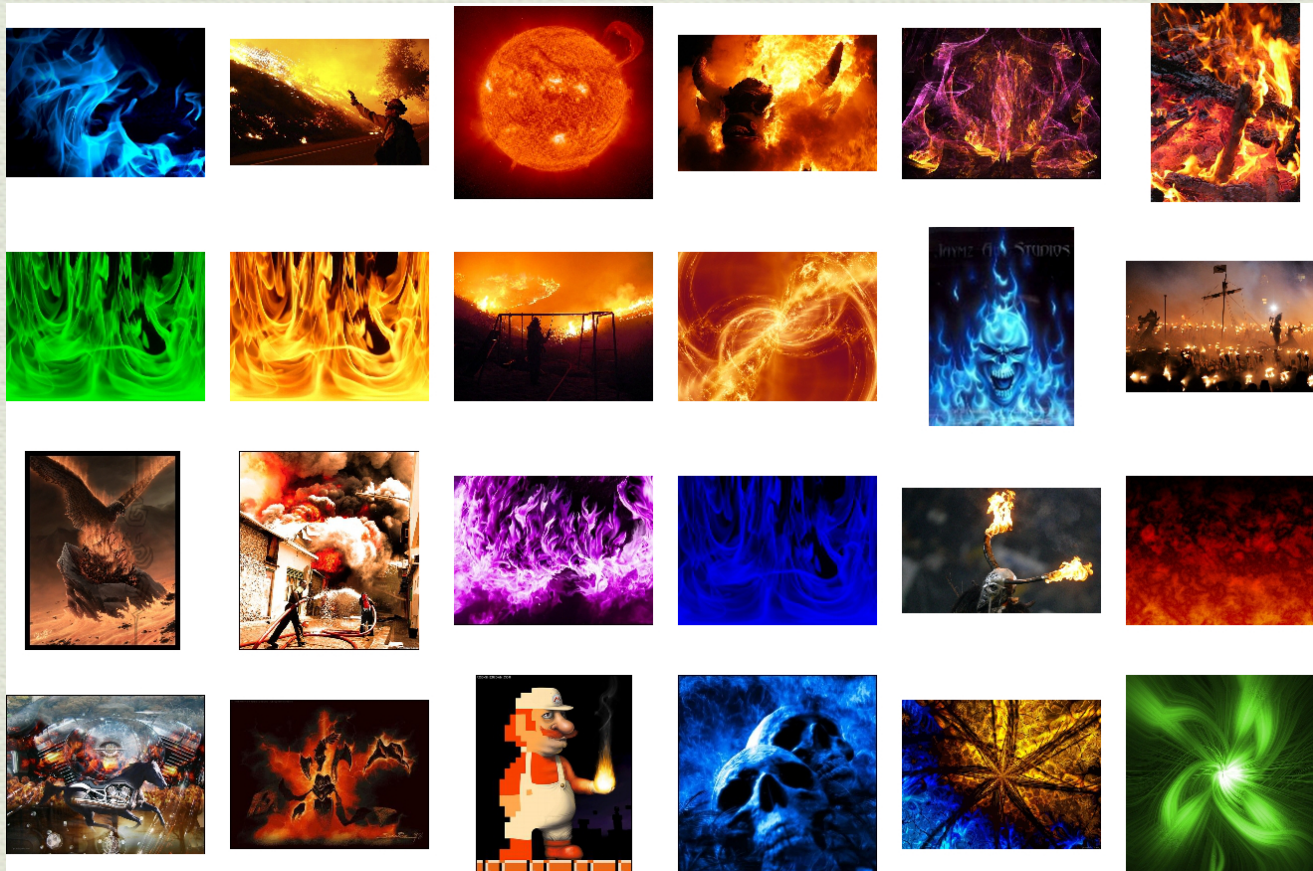
Happy



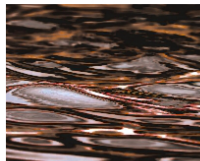
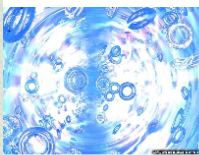
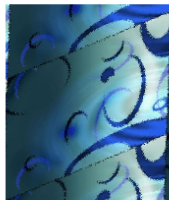
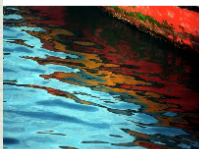
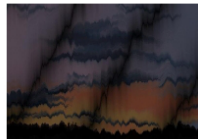
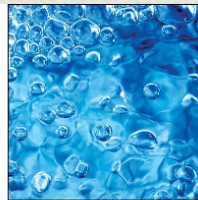
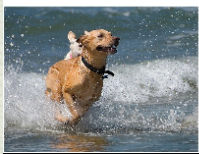
Failures



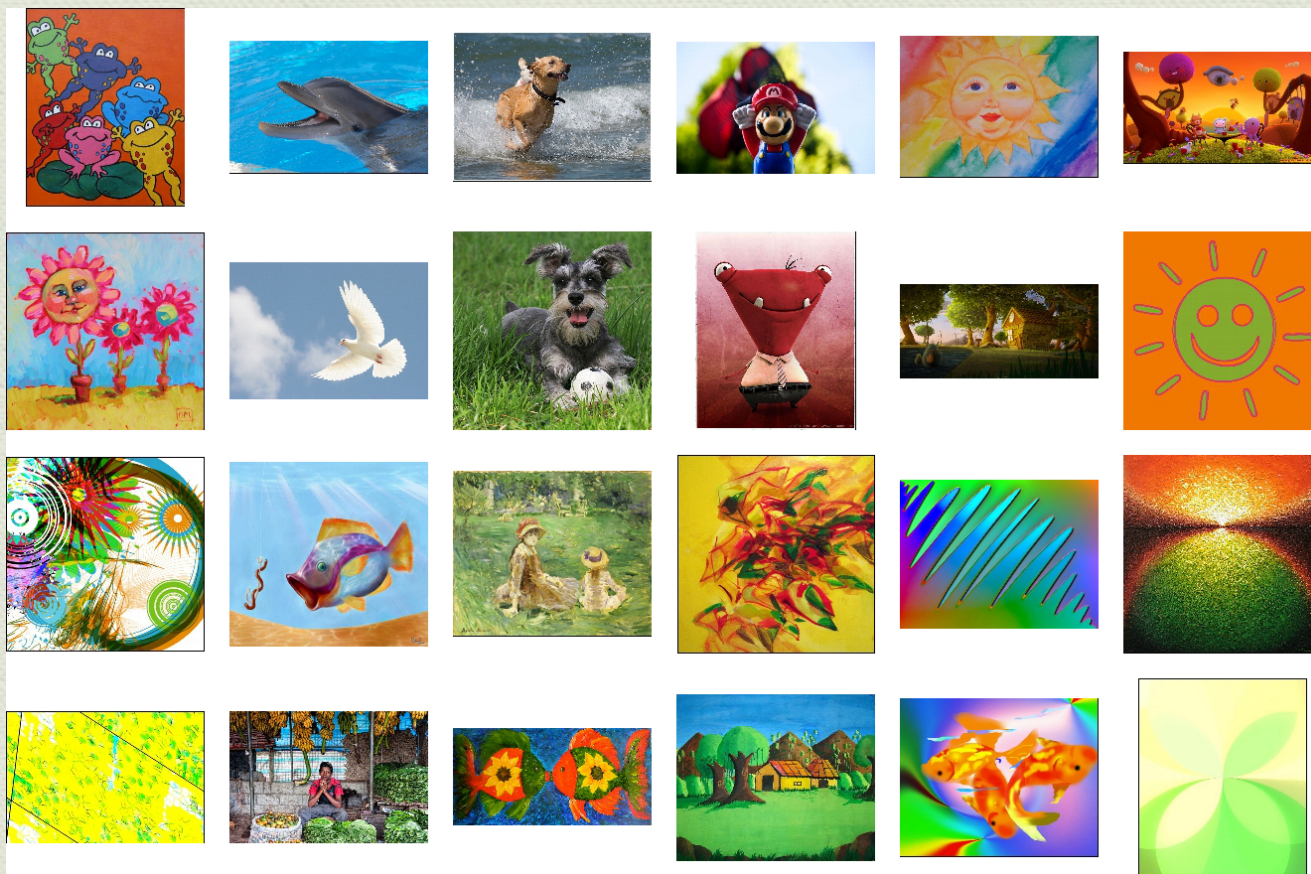
Fiery



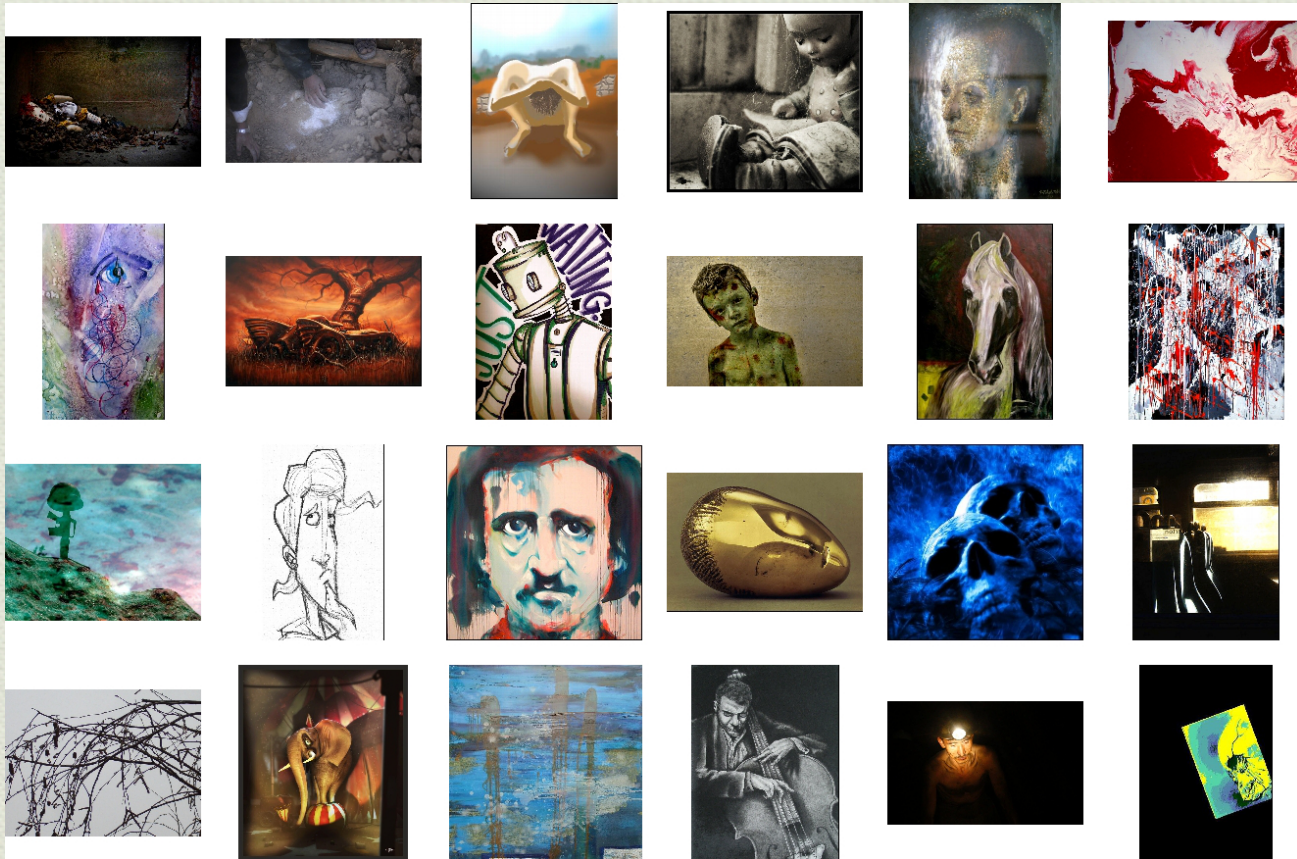
Wet



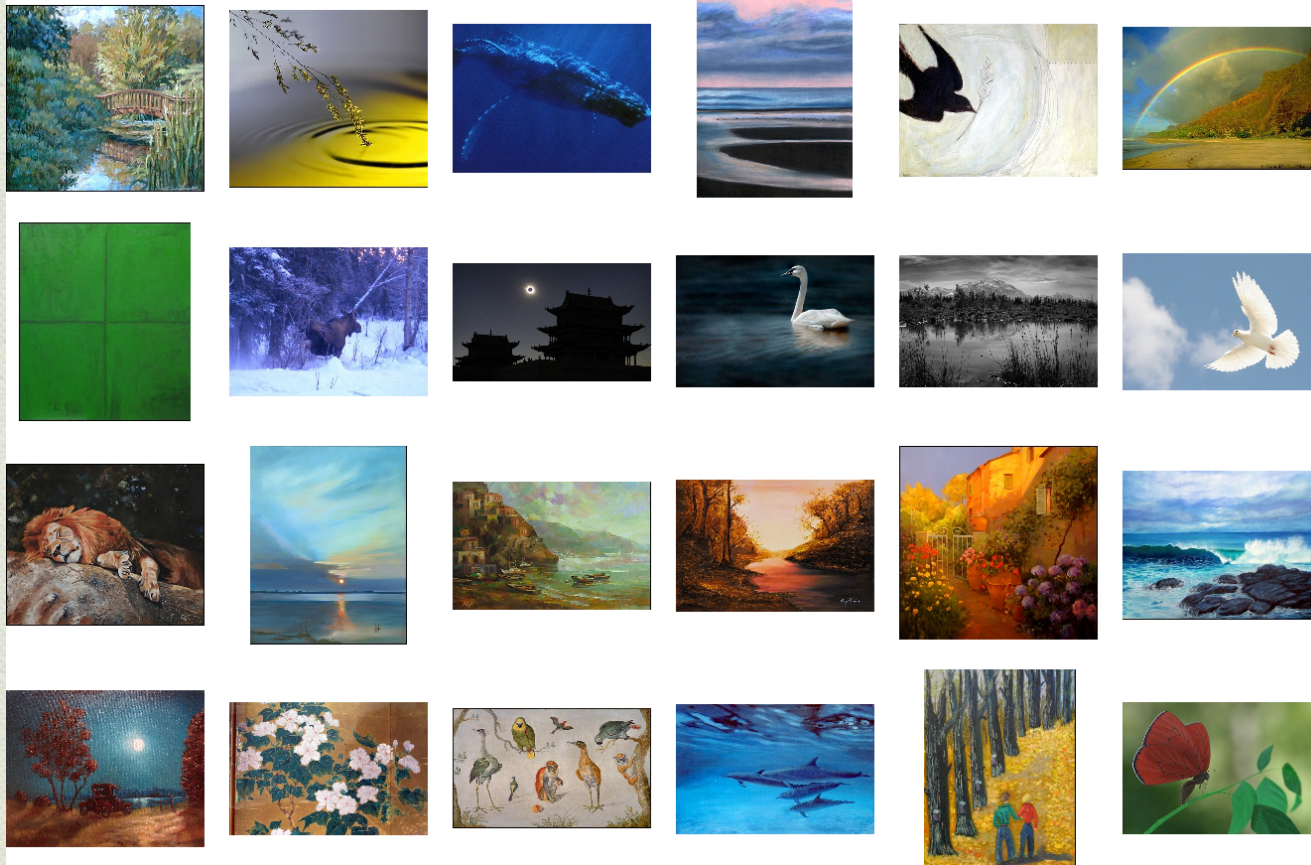
Happy



Sad

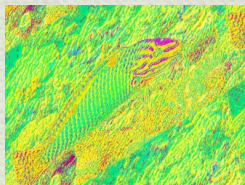


Peaceful

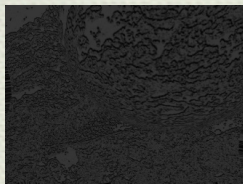


Adjective

Successes

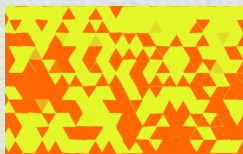
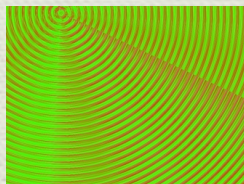


happy

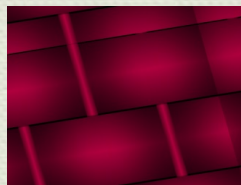


sad

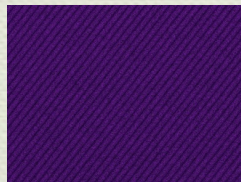
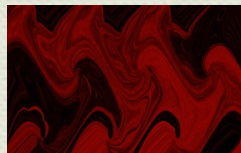
Failures



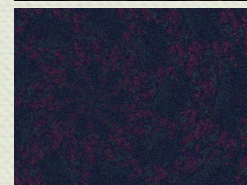
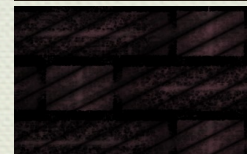
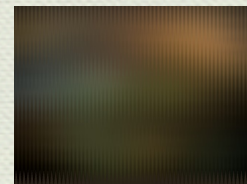
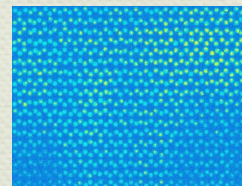
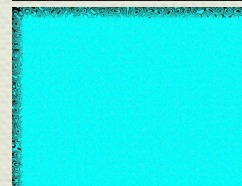
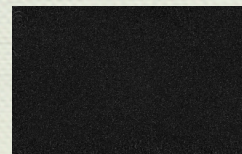
happy



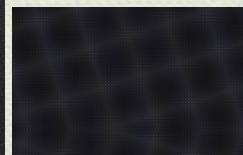
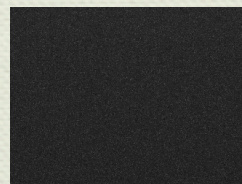
fiery



wet



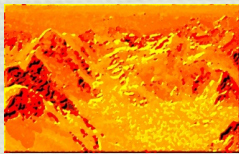
peaceful



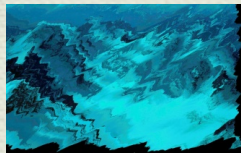
sad

Average

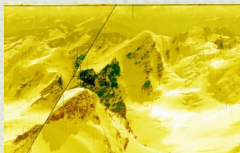
Successes



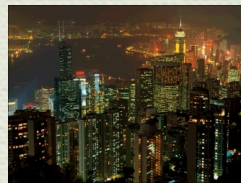
fiery



wet



happy



peaceful



happy

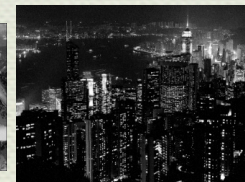


fiery

Failures



sad

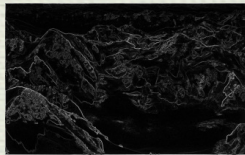


wet

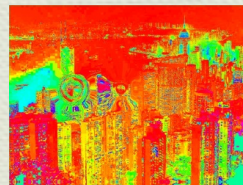
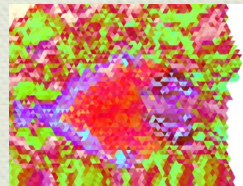
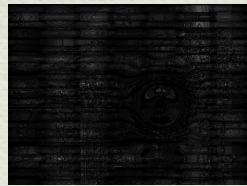
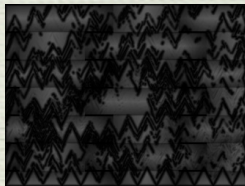


Minimum

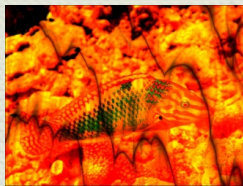
Successes



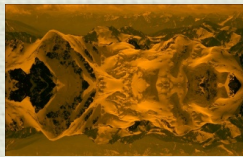
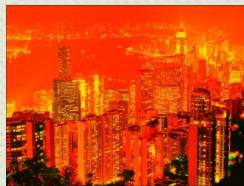
sad



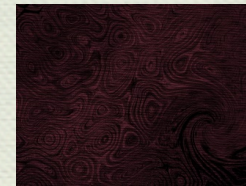
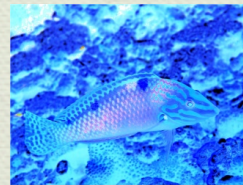
happy



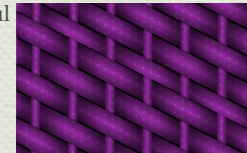
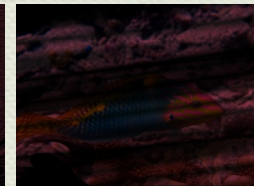
fiery



wet



peaceful



happy

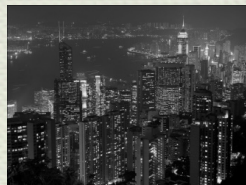
Failures

Alternate Similarity

Successes



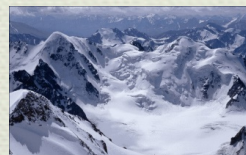
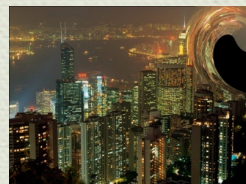
fiery



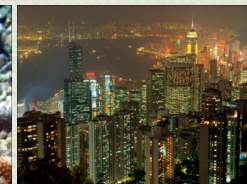
happy



peaceful



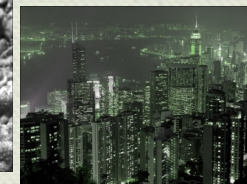
Failures



wet

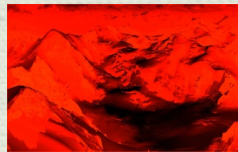
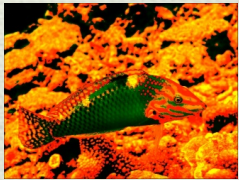


sad

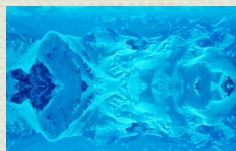


Alternate Adjective

Successes



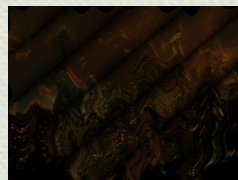
fiery



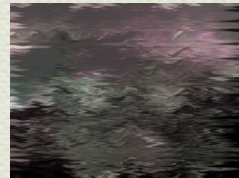
wet



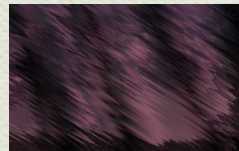
happy



sad

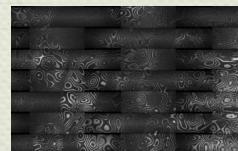
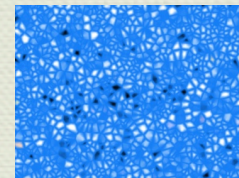
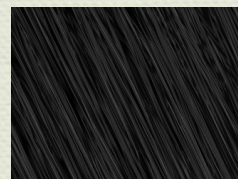


peaceful

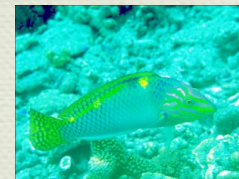


happy

Failures



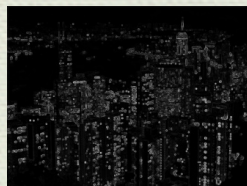
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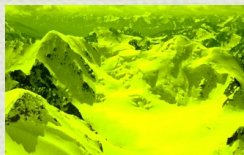
wet

Converge Similarity

Successes



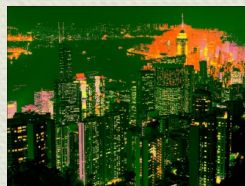
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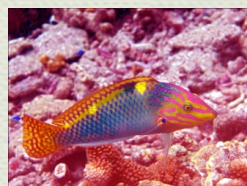
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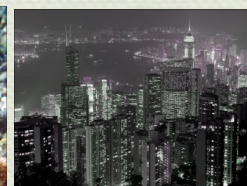
fiery



happy



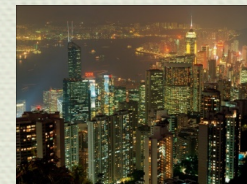
fiery



peaceful



happy



sad



wet

Failures

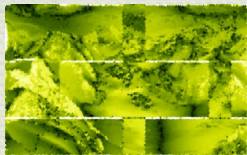
Converge Adjective



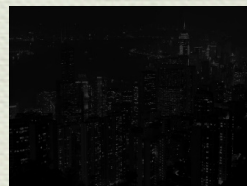
wet



fiery



fiery

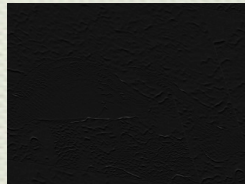


sad



happy

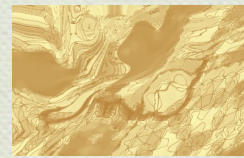
Failures



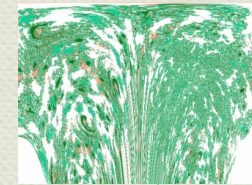
fiery



happy

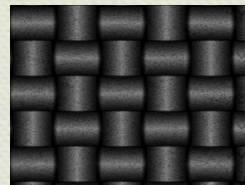


happy

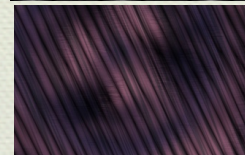


wet

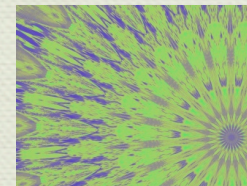
Successes



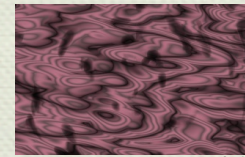
sad



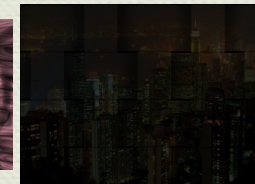
sad



peaceful

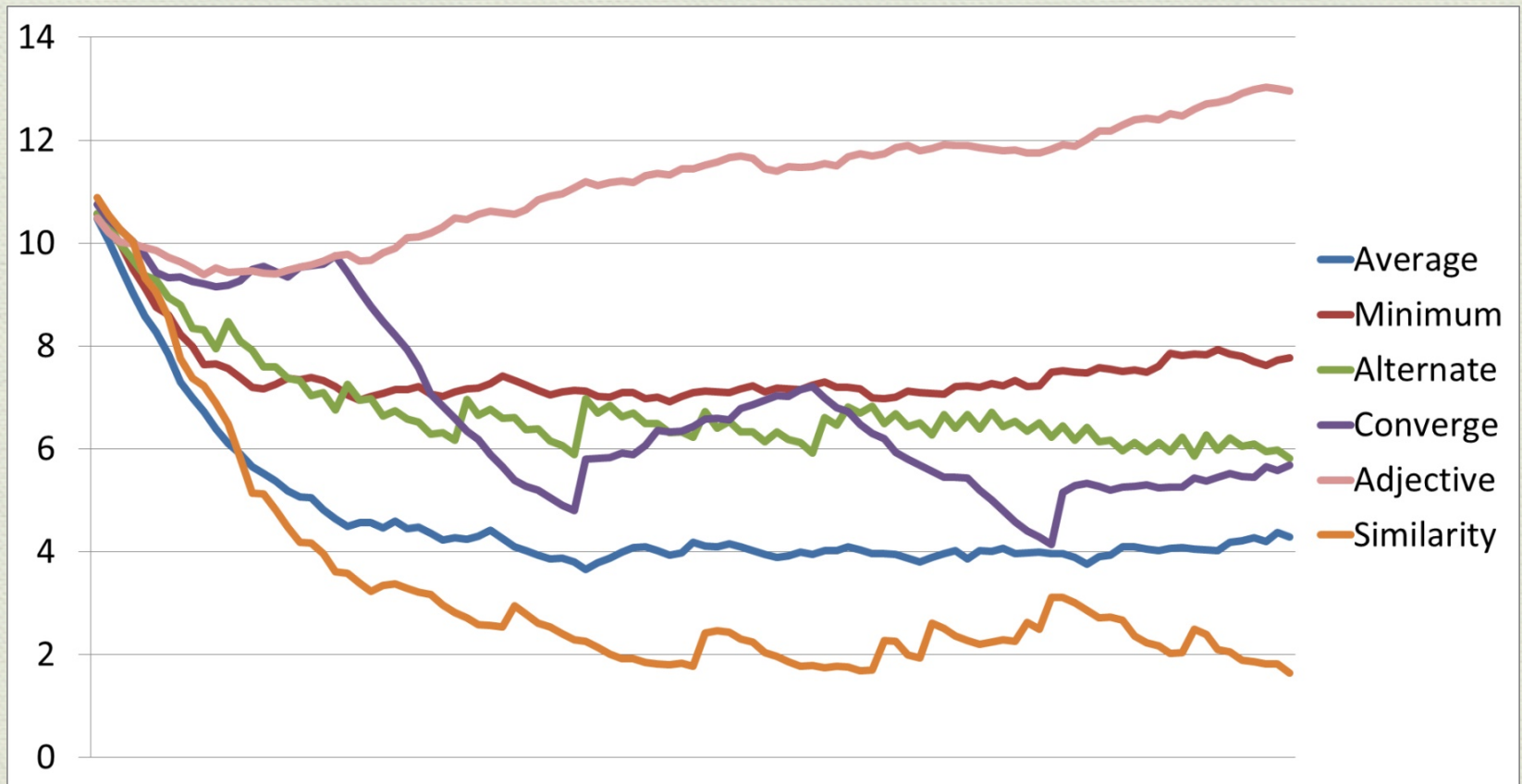


peaceful



sad

Genotype Length



Performance of Adjective Matching

