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

Chosen by Human
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

Fiery

Training Set

$P(rank(d)) = \frac{\text{rank}(d)}{\sum_{i=0}^{n} i}$
Similarity Metric

**Interest Points**

**Visual Words**

**Bag-of-Visual-Words**

Source Image

Phenotype

\[
\text{similarity} = 1 - \frac{\cos^{-1} \left( \frac{A \cdot B}{\|A\|\|B\|} \right)}{\pi}
\]
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

Image Features

Fiery

0.84

0.76

0.80
Minimum Fitness Function

Image Features

Fiery

0.84

0.76

0.76

0.76
Alternate Fitness Function

Image Features

Fiery

0.84
Alternate Fitness Function

Image Features

Fiery
Converge Fitness Function

Image Features

Fiery

0.84

0.84
Converge Fitness Function

Image Features

Fiery

20 Generations
Converge Fitness
Function

Image Features

Fiery

0.76

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

Failures

Interest
Success vs. Failure

Successes

Failures

Interest
Success vs. Failure

Adjective Matching

Successes

Failures

Fiery
Success vs. Failure

Adjective Matching

Successes

Happy

Failures
Fiery
Wet
Happy
Sad
Peaceful
Adjective

Successes

Failures

happy

fiery

sad

happy

wet

peaceful

sad
Average

Successes

Failures

happy

peaceful

fiery

wet

happy

fiery

sad

wet
Minimum

Successes
- sad
- fiery
- happy

Failures
- peaceful
- wet
- happy
Alternate Similarity

Successes

Failures

- fiery
- happy
- peaceful

- wet
- sad
Converge Similarity

Successes

Failures
Converge Adjective

Successes

Failures

Wet

Fiery

Happy

Sad

Peaceful
Genotype Length
Performance of Adjective Matching

- grey
- black-and-white
- blue
- green
- colorful
- red
- warm (color)
- warm
- pink
- cool (color)
- busy
- orange
- cloudy
- detailed
- dark
- brown
- purple
- violent
- pencilled
- plain
- hot
- fiery
- bright
- warm (friendly)
- cold
- complex
- colorful (interesting)
- yellow
- bleached
- naturalistic
- bloody
- green (political)
- scenic
- eerie
- amazing
- sinister
- simplified

- all
- bright
- beautiful
- simple
- light
- brooding
- menacing
- photographic
- painted
- textured
- chilling
- bleary
- ugly
- paintefly
- messy
- geometric
- abstract
- atmospheric
- realistic
- patterned
- childish
- awful
- blockish
- capricious
- wild
- sad
- happy
- moving
- calm
- glooming
- abstract
- creepy
- huge
- cough
- wet
- sketchy
- kitchy
- reflective

- silly
- phantasмагoric
- pretty
- creepy
- busy
- figural
- two-dimensional
- gestural
- white
- weird
- detached
- squiggle
- mathematical
- crazy
- majestic
- powerful
- layered
- freakly
- blochled
- round
- symmetrical
- lonely
- glazed
- cryptic
- still
- linear
- crinkled
- odd
- distressing
- exghastly
- peaceful
- aglow
- fury
- natural
- active
- interesting

0.4 0.6 0.8 1