Metric Learning for Facial Descriptors

Rudnev A.

Sunday 7th July, 2019

Used metric

Original cosine similarity

$$cos(\theta) = \frac{A * B}{||A|| * ||B||} \tag{1}$$

Modified cosine similarity

$$cos(\theta) = \frac{A * B - prod}{(||A|| - len1) * ||B||} \tag{2}$$

Selection of "prod"

Increasing the "prod" gives us an increase in the score.

Submission and Description	Private Score	Public Score
baseline.csv 13 hours ago by Alexander Rudnev prod-2	0.85464	0.84280
baseline.csv 13 hours ago by Alexander Rudnev prod-0.75	0.85446	0.84268
baseline.csv 13 hours ago by Alexander Rudnev prod-0.5	0.85442	0.84265
baseline.csv 13 hours ago by Alexander Rudnev prod-0.1	0.85436	0.84261
baseline.csv 13 hours ago by Alexander Rudnev prod+0.1	0.85433	0.84259

Selection of "prod"

Until some point...

baseline.csv 12 hours ago by Lucky Alex prod-162	0.86085	0.84990
baseline.csv 13 hours ago by Lucky Alex prod-125	0.86088	0.84965
baseline.csv 13 hours ago by Lucky Alex -175	0.86071	0.84981
baseline.csv 13 hours ago by Lucky Alex -150	0.86093	0.84989
baseline.csv 13 hours ago by Lucky Alex -100	0.86060	0.84905

Selection of "len1"

Increasing the variable gives us an increase in the score, again.

baseline.csv 12 hours ago by Lucky Alex len1 -4	0.86270	0.85169
baseline.csv 12 hours ago by Lucky Alex len1 -2	0.86174	0.85077
baseline.csv 12 hours ago by Lucky Alex len1 -1	0.86129	0.85032
baseline.csv 12 hours ago by Lucky Alex len1 +1	0.86043	0.84947

Selection of "len1"

Find maximum point using binary lifting, then smth like binary search

Submission and Description	Private Score	Public Score
baseline.csv 12 hours ago by Lucky Alex len1 -10	0.86623	0.85442
baseline.csv 12 hours ago by Lucky Alex len1 -12	0.86525	0.85462
baseline.csv 12 hours ago by Lucky Alex len1 -16	0.85771	0.85011
baseline.csv 12 hours ago by Lucky Alex len1 -8	0.86484	0.85370
baseline.csv 12 hours ago by Lucky Alex len1 -100	0.82709	0.81823

Final metric

Modified cosine similarity

$$cos(\theta) = \frac{A * B - 162}{(||A|| - 10) * ||B||} \tag{3}$$