MMAI HW1 Report

R05944013 網媒二 高滿馨

Part1. Result Table

Setups	Global Color	Local Color	Texture	Fusion	RP(50%)	RP(25%)
aloe_vera_gel	0.241	0.315	**0.212**	0.305	0.1	0.125
baby_shoes	**0.356**	**0.352**	0.168	**0.348**	**0.185**	0.127
bicycle	**0.324**	**0.337**	0.136	**0.347**	0.138	**0.167**
bottle	0.23	0.167	0.142	0.17	0.138	0.135
bracelet	0.279	0.306	0.132	0.293	**0.232**	0.157
cartoon_purse	0.251	0.286	0.124	0.276	0.126	0.14
chair	0.182	0.19	0.143	0.192	0.11	0.17
children_dress	**0.39**	**0.369**	**0.193**	**0.368**	**0.183**	**0.183**
cup	**0.364**	**0.39**	**0.193**	**0.399**	**0.166**	**0.177**
drum	0.3	**0.332**	0.112	**0.339**	0.13	0.14
garment	**0.476**	**0.512**	**0.381**	**0.518**	0.32	**0.287**
gge_snack	**0.459**	**0.54**	0.18	**0.544**	**0.204**	**0.26**
glasses	0.155	0.169	0.123	0.164	0.093	0.1
hand_cream	0.305	0.297	**0.213**	0.302	0.107	0.118
korean_snack	**0.444**	**0.451**	0.146	0.44	0.143	0.107
leather_purse	0.158	0.19	**0.288**	0.219	0.123	0.122
men_clothes	**0.422**	**0.447**	**0.237**	**0.444**	**0.368**	**0.213**
minnie_dress	**0.658**	**0.64**	0.16	**0.635**	**0.359**	**0.26**
minnie_shoes	0.217	0.213	**0.18**	0.218	0.124	0.113
nba_jersey	0.106	0.113	0.113	0.112	0.095	0.12
orange	0.255	0.275	0.129	0.27	0.108	0.14
overalls	0.246	0.23	**0.248**	0.228	0.18	0.152
skirt	**0.42**	**0.426**	**0.183**	**0.424**	0.13	**0.162**
trousers	0.126	0.135	0.133	0.139	0.102	0.134
women_clothes	**0.362**	**0.377**	**0.187**	**0.369**	0.16	**0.225**
Mean MAP	0.31	0.323	0.178	0.323	0.165	0.161

Note: The highest AP is marked with red, the lowest AP is marked with green, the score higher than average score is marked with **bold** weight.

Parameter Setting
Distance type: D1
Global Color: global color histogram with 4096(16**3) bins
Local Color: local color histogram with 4096 (16**3)bins and divided to 9 (3*3) regions
Texture: local Gabor filter, divided to 9 (3*3) regions with filter parameter: theta { 0, pi/4, pi/2, 3pi/4 }, sigma { 1,2,3,4 }, lambda {0, pi/4, pi/2, 3pi/4 }
Fusion: 0.8*Local Color + 0.2 *Local Gabor filter
RandomProjection: reduce local color histogram features

Part2. Discussion

Experiments show that Category ***minnie_dress*** and ***men_clothes*** got the best accuracy while Category ***nba_jersey*** got the worst accuracy. According to MMAP, it is clear that the method color histogram always performs better than Gabor filter and local features always perform better than global features. As the result, I combine local color histogram and local Gabor filter with weight 0.8 and 0.2 respectively in fusion method. However, the accuracy still cannot outperform local color histogram. I think that the reason why Gabor filter didn't get satisfied results is because the parameter is not well-designed.
The reason why *minnie_dress* gets the best accuracy may because photos in *minnie_dress* are more similar, mostly composed with color black, red and white thus always gets the best result in color histogram. However, some photos are in different viewing angle thus the score in Gabor filter is lower. On the other hand, although *men_clothes* photos are not always have same color, however, photos are always in same viewing angle thus get better score in Gabor filter.
In conclusion, photos with similar colors and viewing angle will get better score with color histogram and Gabor filter method. However, I think that complex background and variant scales of objects in photos problem cannot be solved by both color histogram and Gabor filter, thus maybe should find more feature to handle with it.