

Results from SHREC 2006 bench mark and results using our methods

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<http://give-lab.cs.uu.nl/shrec/shrec2006/allRunfiles.html>

Mean Average Precision(highly relevant)			
Rank	Participant	Run	Value
	*Method A		0.6175
1	Shilane et al.	3	0.536588
2	Zaharia et al.	1	0.503491
	*Learned MRSPRH		0.453852
3	Makadia et al.	2	0.486946
4	Shilane et al.	2	0.480416
5	Makadia et al.	1	0.474208
6	Daras et al.	1	0.447497
7	Papadakis et al.	1	0.439
8	Shilane et al.	1	0.407198
9	Chaouch et al.	1	0.403972
	*Learned MRAAD		0.384132
	*MRSPRH(KLD)		0.376057
10	Chaouch et al.	2	0.340585
11	Makadia et al.	3	0.334469
	*MRAAD		0.332241
12	Makadia et al.	4	0.315429
	*SRSPRH(KLD)		0.28863
	*SRAAD		0.237441
13	Laga et al.	1	0.232768
14	Laga et al.	2	0.22275
15	Jayanti et al.	2	0.170842
16	Jayanti et al.	3	0.15204
17	Jayanti et al.	1	0.143771

Mean Average Precision(relevant)			
Rank	Participant	Run	Value
	*Method A		0.5966
1	Shilane et al.	3	0.519214
2	Zaharia et al.	1	0.509376
3	Shilane et al.	2	0.49619
4	Makadia et al.	2	0.436417
5	Makadia et al.	1	0.419766
6	Shilane et al.	1	0.416909
	*Learned MRSPRH		0.410527
7	Daras et al.	1	0.395225
8	Papadakis et al.	1	0.389886
	*Learned MRAAD		0.366346
	*MRSPRH(KLD)		0.355191
9	Chaouch et al.	1	0.354335
	*MRAAD		0.324646
10	Chaouch et al.	2	0.316559
	*SRSPRH(KLD)		0.317918
11	Makadia et al.	3	0.268425
	*SRAAD		0.260284
12	Makadia et al.	4	0.24939
13	Laga et al.	1	0.213509
14	Laga et al.	2	0.200307
15	Jayanti et al.	2	0.195591
16	Jayanti et al.	1	0.16448
17	Jayanti et al.	3	0.163372

Mean First Tier(highly relevant)			
Rank	Participant	Run	Value
	*Method A		57.92%
1	Makadia et al.	2	44.77%
2	Makadia et al.	1	43.78%
	*Learned MRSPRH		43.12%
3	Daras et al.	1	42.75%
4	Papadakis et al.	1	41.86%
5	Shilane et al.	3	40.87%
6	Zaharia et al.	1	39.21%
7	Chaouch et al.	1	38.13%
8	Shilane et al.	2	37.91%
	*Learned MRAAD		36.80%
	*MRSPRH(KLD)		34.93%
9	Chaouch et al.	2	32.15%
	*MRAAD		31.02%
10	Shilane et al.	1	30.97%
11	Makadia et al.	3	29.99%
12	Makadia et al.	4	28.43%
	*SRSPRH(KLD)		26.68%
	*SRAAD		24.55%
13	Laga et al.	1	24.11%
14	Laga et al.	2	23.13%
15	Jayanti et al.	2	17.28%
16	Jayanti et al.	3	15.95%
17	Jayanti et al.	1	15.06%

Mean First Tier(relevant)			
Rank	Participant	Run	Value
	*Method A		56.65%
1	Makadia et al.	2	40.55%
	*Learned MRSPRH		39.98%
2	Makadia et al.	1	38.79%
3	Shilane et al.	3	37.40%
4	Papadakis et al.	1	37.40%
5	Shilane et al.	2	37.31%
6	Daras et al.	1	37.03%
	*Learned MRAAD		35.85%
7	Zaharia et al.	1	34.20%
8	Chaouch et al.	1	34.08%
	*MRSPRH(KLD)		32.84%
	*SRSPRH(KLD)		31.77%
	*MRAAD		31.38%
9	Chaouch et al.	2	30.32%
10	Shilane et al.	1	29.79%
	*SRAAD		26.48%
11	Makadia et al.	3	25.41%
12	Makadia et al.	4	24.53%
13	Laga et al.	2	22.23%
14	Laga et al.	1	21.98%
15	Jayanti et al.	2	20.17%
16	Jayanti et al.	1	18.17%
17	Jayanti et al.	3	17.07%

Mean Dynamic Average Recall			
Rank	Participant	Run	Value
	*Method A		0.6492
1	Makadia et al.	2	0.549863
2	Makadia et al.	1	0.540848
	*Learned MRSPRH		0.527611
3	Daras et al.	1	0.524241
4	Chaouch et al.	1	0.500183
5	Papadakis et al.	1	0.495233
6	Shilane et al.	3	0.493715
7	Zaharia et al.	1	0.492473
8	Shilane et al.	2	0.487706
	*Learned MRAAD		0.480721
	*MRSPRH(KLD)		0.463133
	*MRAAD		0.432029
9	Chaouch et al.	2	0.421568
	*SRSPRH(KLD)		0.398964
10	Shilane et al.	1	0.397066
11	Makadia et al.	3	0.392495
12	Makadia et al.	4	0.376673
	*SRAAD		0.336364
13	Laga et al.	1	0.326314
14	Laga et al.	2	0.3062
15	Jayanti et al.	2	0.267852
16	Jayanti et al.	3	0.237022
17	Jayanti et al.	1	0.230207

Mean Normalized Cumulated Gain @25			
Rank	Participant	Run	Value
	*Method A		0.6778
1	Makadia et al.	2	0.549824
	*Learned MRSPRH		0.537946
2	Makadia et al.	1	0.52457
3	Daras et al.	1	0.523512
4	Shilane et al.	3	0.519081
5	Papadakis et al.	1	0.498866
	*Learned MRAAD		0.488574
6	Zaharia et al.	1	0.486775
7	Shilane et al.	2	0.481823
8	Chaouch et al.	1	0.480672
	*MRSPRH		0.4519
9	Chaouch et al.	2	0.44134
	*MRAAD		0.438576
	*SRSPRH		0.391982
10	Shilane et al.	1	0.376791
11	Makadia et al.	3	0.370043
12	Makadia et al.	4	0.351979
	*SRAAD		0.34051
13	Laga et al.	2	0.310443
14	Laga et al.	1	0.306715
15	Jayanti et al.	2	0.259875
16	Jayanti et al.	3	0.220841
17	Jayanti et al.	1	0.212145

Mean Normalized Discounted Cumulated Gain @25			
Rank	Participant	Run	Value
	*Method A		0.6958
1	Makadia et al.	2	0.590602
	*Learned MRSPRH		0.587107
2	Daras et al.	1	0.57909
3	Makadia et al.	1	0.576854
4	Shilane et al.	3	0.566407
5	Papadakis et al.	1	0.54827
6	Chaouch et al.	1	0.546963
7	Zaharia et al.	1	0.539963
	*Learned MRAAD		0.534729
8	Shilane et al.	2	0.534559
	*MRSPRH		0.510094
9	Chaouch et al.	2	0.485256
	*MRAAD		0.479294
10	Makadia et al.	3	0.440445
	*SRSPRH		0.438447
11	Shilane et al.	1	0.430015
12	Makadia et al.	4	0.421528
	*SRAAD		0.37712
13	Laga et al.	1	0.376507
14	Laga et al.	2	0.361473
15	Jayanti et al.	2	0.310237
16	Jayanti et al.	3	0.265014
17	Jayanti et al.	1	0.253685

Method A	Unpublished result.
Learned_MRSPRH	Unsupervised learning of a corpus (4000 models) using MRSPRH shape feature (cosine distance) [Ohbuchi06b]
Learned_MRAAD	Unsupervised learning of a corpus (5000 models) using MRAAD shape feature (cosine distance) [Ohbuchi06b]
MRSPRH	Multiresolution version of the SPRH [Wahl]. Alpha-MR method proposed by [Ohbuchi03] is used.
MRAAD	Multiresolution version of the AAD, as described in [Ohbuchi03], but with Cosine distance instead of L2 norm.
SRSPRH	Wahl's SPRH [Wahl03] for surface models by using quasi-monte Carlo sampling of the surface geometry [Ohbuchi06a].
SRAAD	Almost the same as the AAD [Ohbuchi03a, Ohbuchi05] but with Cosine distance, instead of L2 norm.

References

[Ohbuchi03a]	Ryutarou Ohbuchi, Takahiro Minamitani, Tsuyoshi Takei, Shape Similarity Search of 3D Models by using Enhanced Shape Functions, pp. 97–104, <i>Theory and Practice of Computer Graphics 2003 (TP.CG)</i> .
[Ohbuchi03b]	Ryutarou Ohbuchi, Tsuyoshi Takei, Shape-Similarity Comparison of 3D Shapes Using Alpha Shapes, <i>Proc. Pacific Graphics 2003</i> , pp. 293–302, October 8–10, Canmore, Canada.
[Ohbuchi05]	Ryutarou Ohbuchi, Takahiro Minamitani, Tsuyoshi Takei, Shape-similarity search of 3D models by using enhanced shape functions, <i>International Journal of Computer Applications in Technology (IJCAT)</i> .
[Ohbuchi06a]	Ryutarou Ohbuchi, Yushin Hata, Combining Multiresolution Shape Descriptors for 3D Model Retrieval, <i>Proc. WSCG 2006</i> , Plzen, Czech Republic, Jan. 30~Feb. 2, 2006.
[Ohbuchi06b]	Ryutarou Ohbuchi, Jun Kobayashi, Unsupervised Learning from a Corpus for Shape-Based 3D Model Retrieval, <i>accepted</i> , ACM MIR 2006, Santa Barbara, CA, U.S.A., Oct. 2006
[Wahl03]	[Wahl03] E. Wahl, U. Hillenbrand, G. Hirzinger, Surflet-Pair-Relation Histograms: A Statistical 3D-Shape Representation for Rapid Classification, <i>Proc. 3DIM 2003</i> , pp. 474–481, IEEE Press, (2003).

* Note1: Learned_MRSPRH and Method_B are yet to be published.

* Note2: While [Ohbuchi06] describes combining multiple shape features by using Purity analogue [Bustos04], none of our results above used purity based combination.

* Note3: All our papers listed above can be found at the following URL.

<http://www.kki.yamanashi.ac.jp/~ohbuchi/publication.html>