

MS 2008 features list

This file contains an exhaustive list of texture features as used in the article
"Feature based prediction of the perceived and aesthetic properties of visual textures",
presented at "Materials and Sensations 2008", PAU, France.

The total of **188 features** can be split into 6 categories:

	number of features
Gray Level Co-occurrence Matrix features	88
Neighbourhood Gray-Tone Difference Matrix features	10
Tamura features	6
Fourier spectrum features	44
Colour features	9
Gabor energy map features	31
total:	188

see the worksheet [feature list](#) for the feature list

see the worksheet [params_comments](#) for information on feature parameters and several comments related to the feature computation.

parameters / comments

GLCM *levels* number of quantization levels (preprocessing for GLCM computation)
 distance length of displacement vector

the name prefix 'm_' indicates that the feature is the mean of 4 features computed for different vector angles.

the name prefix 'r_' indicates that the feature is the range of 4 features computed for different vector angles.

NGTDM *d* size of neighbourhood (e.g. d=2 is a 5x5 neighbourhood)

Fourier *rings* number of circular rings for partition
 wedges number of wedges used for partition

the name prefix 'c' indicates that the features is based on a circular partition of the fourier power spectrum, 'w' indicates that a wedge like partition was used.

e.g. *wEnergy_12* represents the energy represents the energy of
(energy(wedge 12) + energy(wedge 13)) / 2

Gabor *noScales* number of different filter scales used
 noOrient number of different filter orientations used

Gabor single filter parameter

f0 0.03125 frequency of plane wave multiplied by 2 for every scale
eta 1.0 elongation factor of Gaussian envelope in x direction
gamma 0.6 elongation factor of Gaussian envelope in y direction

feature 'oXsY' represents the energy contained in the energy map entry at filter orientation X and filter scale Y, whereas Y=1 is the coarsest, Y=4 the finest scale.

SGOED sum of Gabor orientation energy difference
SGSED sum of Gabor scale energy difference
MGOED mean of Gabor orientation energy difference
MGSED mean of Gabor scale energy difference
mean mean of all energy map entries
stdDev standard deviation of all energy map entries
entropy entropy of all energy map entries

feature list			
ID	category	parameters	name
1	GLCM	levels: 32, distance: 1	m_asm
2			m_contrast
3			m_correlation
4			m_sumOfSquares
5			m_invDiffMoment
6			m_sumAvg
7			m_sumVar
8			m_sumEntropy
9			m_entropy
10			m_diffVar
11			m_diffEntropy
12			r_asm
13			r_contrast
14			r_correlation
15			r_sumOfSquares
16			r_invDiffMoment
17			r_sumAvg
18			r_sumVar
19			r_sumEntropy
20			r_entropy
21			r_diffVar
22			r_diffEntropy
23		levels: 32, distance: 2	m_asm
24			m_contrast
25			m_correlation
26			m_sumOfSquares
27			m_invDiffMoment
28			m_sumAvg
29			m_sumVar
30			m_sumEntropy
31			m_entropy
32			m_diffVar
33			m_diffEntropy
34			r_asm
35			r_contrast
36			r_correlation
37			r_sumOfSquares
38			r_invDiffMoment
39			r_sumAvg
40			r_sumVar
41			r_sumEntropy
42			r_entropy
43			r_diffVar
44			r_diffEntropy
45		levels: 32, distance: 4	m_asm
46			m_contrast

47			m_correlation
48			m_sumOfSquares
49			m_invDiffMoment
50			m_sumAvg
51			m_sumVar
52			m_sumEntropy
53			m_entropy
54			m_diffVar
55			m_diffEntropy
56			r_asm
57			r_contrast
58			r_correlation
59			r_sumOfSquares
60			r_invDiffMoment
61			r_sumAvg
62			r_sumVar
63			r_sumEntropy
64			r_entropy
65			r_diffVar
66			r_diffEntropy
67		levels: 32, distance: 8	m_asm
68			m_contrast
69			m_correlation
70			m_sumOfSquares
71			m_invDiffMoment
72			m_sumAvg
73			m_sumVar
74			m_sumEntropy
75			m_entropy
76			m_diffVar
77			m_diffEntropy
78			r_asm
79			r_contrast
80			r_correlation
81			r_sumOfSquares
82			r_invDiffMoment
83			r_sumAvg
84			r_sumVar
85			r_sumEntropy
86			r_entropy
87			r_diffVar
88			r_diffEntropy
89	NGTDM	d: 1	coarsness
90			contrast
91			busyness
92			complexity
93			strength
94		d: 2	coarsness
95			contrast
96			busyness

97			complexity
98			strength
99	Tamura		coarseness
100			contrast
101			directionality
102			linelikeness
103			regularity
104			roughness
105	Fourier Domain		cVar
106		rings: 12	cStd
107		wedges: 48	cSkew
108			cKurt
109			wVar
110			wStd
111			wSkew
112			wKurt
113			cEnergy_1
114			cEnergy_2
115			cEnergy_3
116			cEnergy_4
117			cEnergy_5
118			cEnergy_6
119			cEnergy_7
120			cEnergy_8
121			cEnergy_9
122			cEnergy_10
123			cEnergy_11
124			cEnergy_12
125			wEnergy_1
126			wEnergy_2
127			wEnergy_3
128			wEnergy_4
129			wEnergy_5
130			wEnergy_6
131			wEnergy_7
132			wEnergy_8
133			wEnergy_9
134			wEnergy_10
135			wEnergy_11
136			wEnergy_12
137			wEnergy_13
138			wEnergy_14
139			wEnergy_15
140			wEnergy_16
141			wEnergy_17
142			wEnergy_18
143			wEnergy_19
144			wEnergy_20
145			wEnergy_21
146			wEnergy_22

147			wEnergy_23
148			wEnergy_24
149	Color		avgInt
150			colorfulness
151			avgSat
152			d_red
153			d_yellow
154			d_green
155			d_cyan
156			d_blue
157			d_magenta
158	Gabor	noScales: 4, noOrient: 6	o1 s1
159			o1 s2
160			o1 s3
161			o1 s4
162			o2 s1
163			o2 s2
164			o2 s3
165			o2 s4
166			o3 s1
167			o3 s2
168			o3 s3
169			o3 s4
170			o4 s1
171			o4 s2
172			o4 s3
173			o4 s4
174			o5 s1
175			o5 s2
176			o5 s3
177			o5 s4
178			o6 s1
179			o6 s2
180			o6 s3
181			o6 s4
182			SGOED
183			SGSED
184			MGOED
185			MGSED
186			mean
187			stdDev
188			entropy