

Fig. 1 - A hierarchical NN.

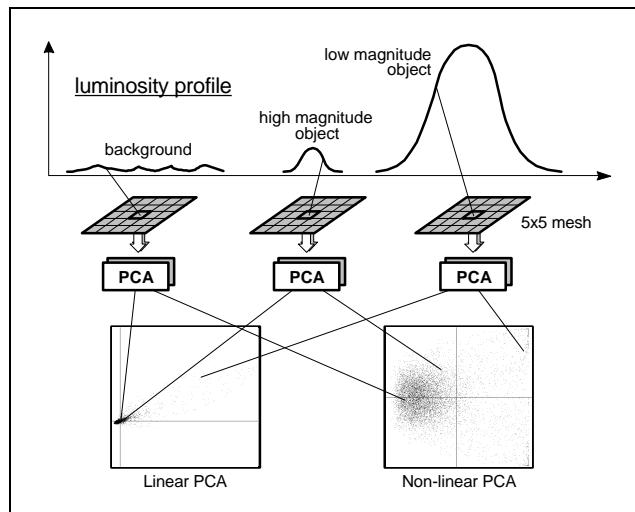


Fig. 2 - Comparison of a Linear PCA and a Non-linear PCA.

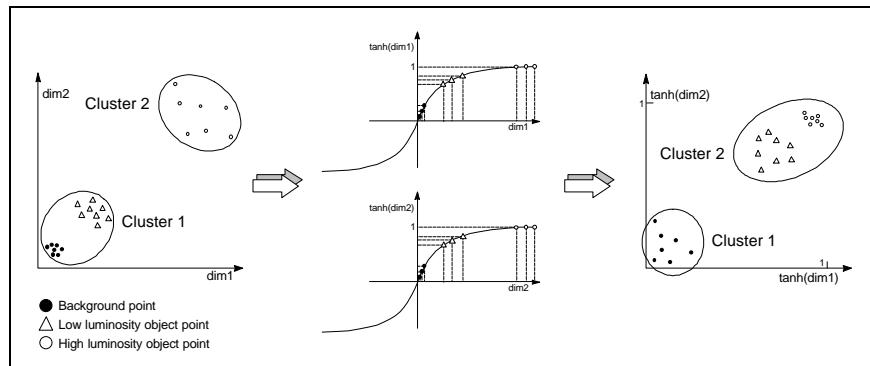


Fig. 3 - Effect of the  $\tanh$  activation function.

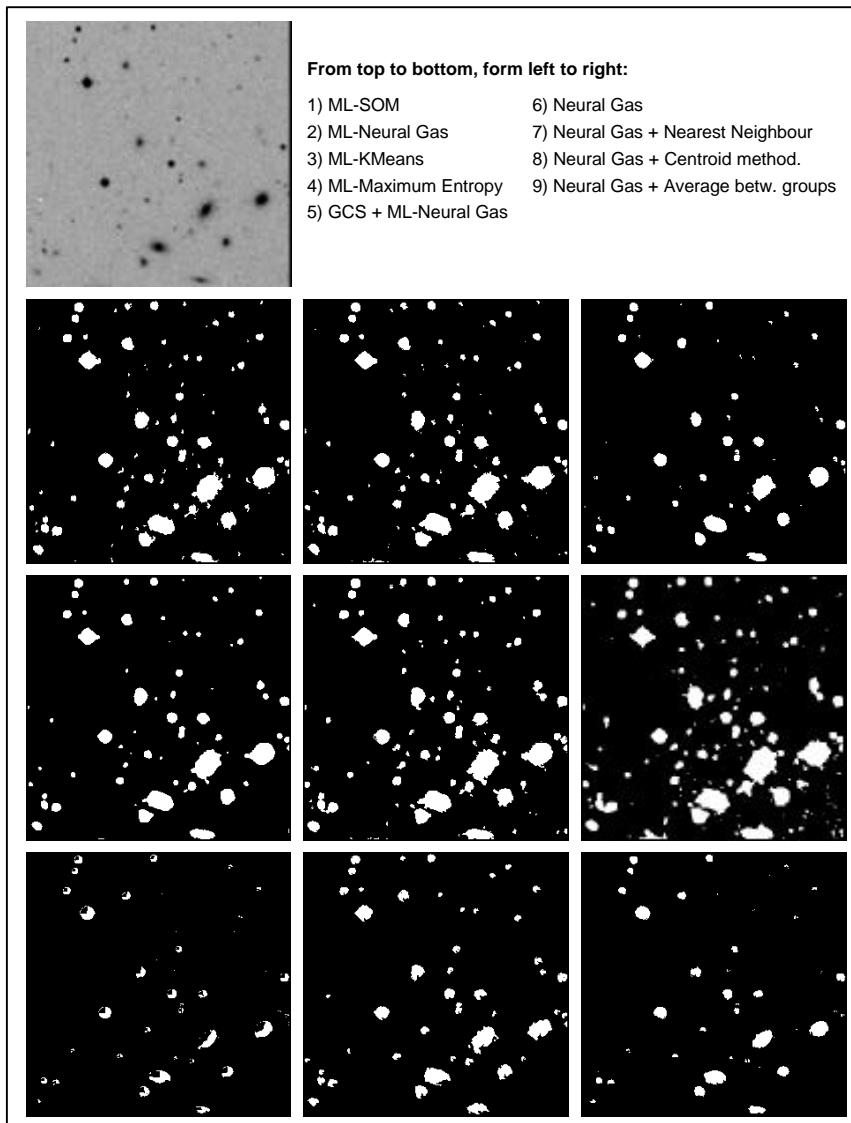


Fig. 4 - Comparison between hierarchical NNs and Hybrid NNs on a real image.

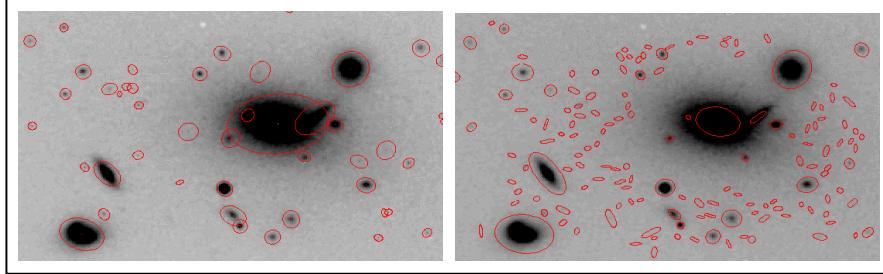


Fig. 5 - Comparison of our method (left) with SKICAT (right) after deblending.

NN type	neurons	avr. distort.	time (sec.)
1 ML-SOM	50 20 6	0.1188	340
2 ML-Neural Gas	50 20 6	0.1163	302
3 ML-K Means	50 20 6	0.1300	112
4 ML-Maximum Entropy	50 20 6	0.3478	217
5 GCS + ML-Neural Gas	50 20 6	0.1166	235
6 Neural Gas	6	0.2831	103
7 " " + Nearest Neighbour	50	0.1163	256
8 " " + Barycentre method.	50	0.1163	249
9 " " + ave. Between groups	50	0.1163	243

Tab 1 – Hierarchical unsupervised NNs performance in image segmentation tasks:  
average distortion and computing time.

NN type	detected obj.	Correct obj.	Corr. Perc.
1 ML-SOM	757	699	92.34
2 ML-Neural Gas	771	720	93.34
3 ML-K Means	426	394	92.49
4 ML-Maximum Entropy	637	607	95.29
5 GCS + ML-Neural Gas	768	719	93.62
6 Neural Gas	1113	720	64.70
7 " " + Nearest Neighbor	384	354	92.19
8 " " + Barycentre Method	438	381	86.99
9 " " + Ave. between Groups	308	297	96.43

Tab 2 – Hierarchical unsupervised NNs performance in object identification tasks.

	FOCAS	Our Method
Total Detected Objects	2443	1923
Spurious Artifacts	635	120
Right Objects	1808	1803
Correctness percent	74.01	93.76

Tab 3 – Comparison of our method with FOCAS on Coma cluster core.