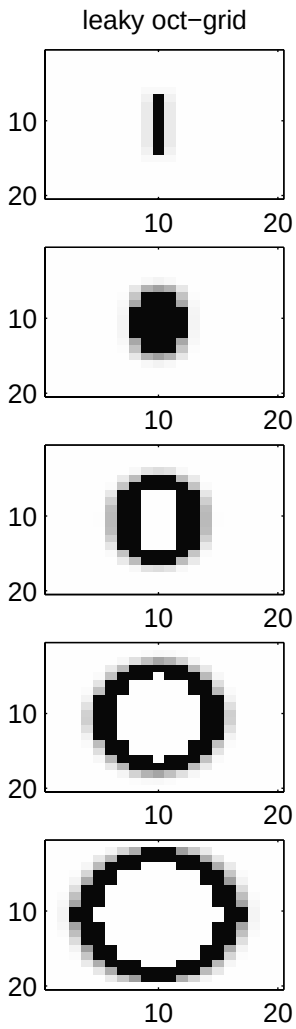


Figure 1. Propagation of a straight line.

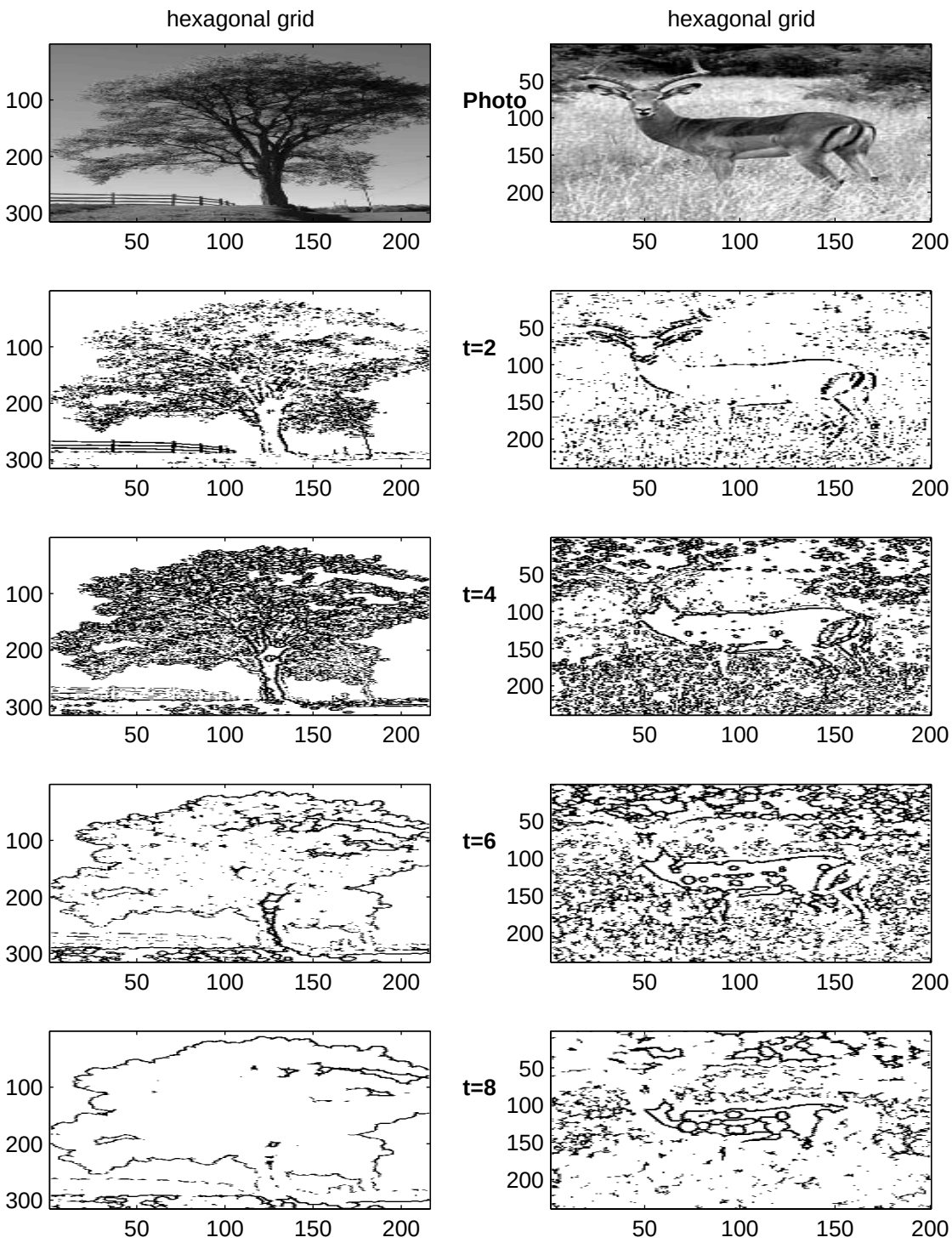


Figure 2. Two examples of propagation of a complex contour image.

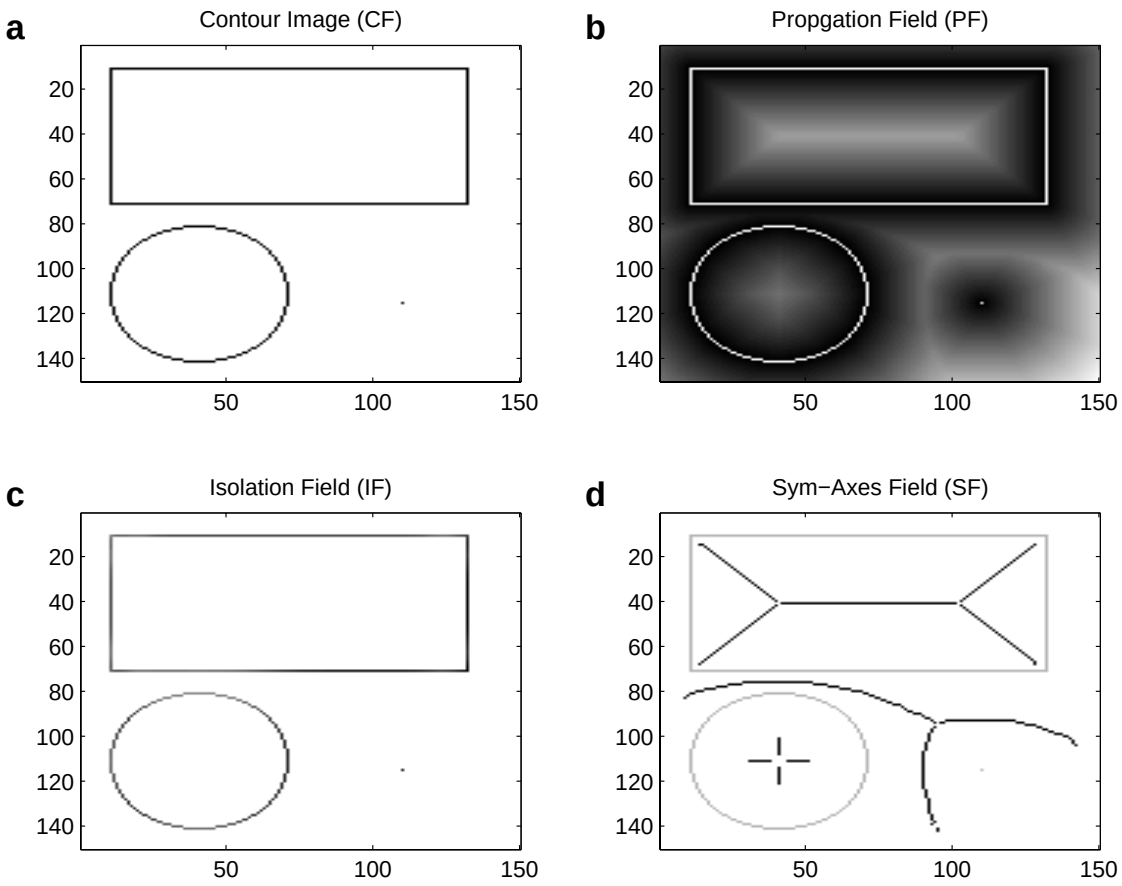


Figure 3. Evolvement for a rectangle, circle and a point. **a**. The contour image. **b**. Propagation field: Completion of wave propagation: increasing luminance values reflect temporal evolvement (original contours in white). The symmetric axes are already visible as 'veins'. **c**. Isolation field: Dark value indicates high degree of isolation. **d**. Symmetric-axis field in black (contours in gray). The field is already broken up into sym-ax segments at points of intersections.

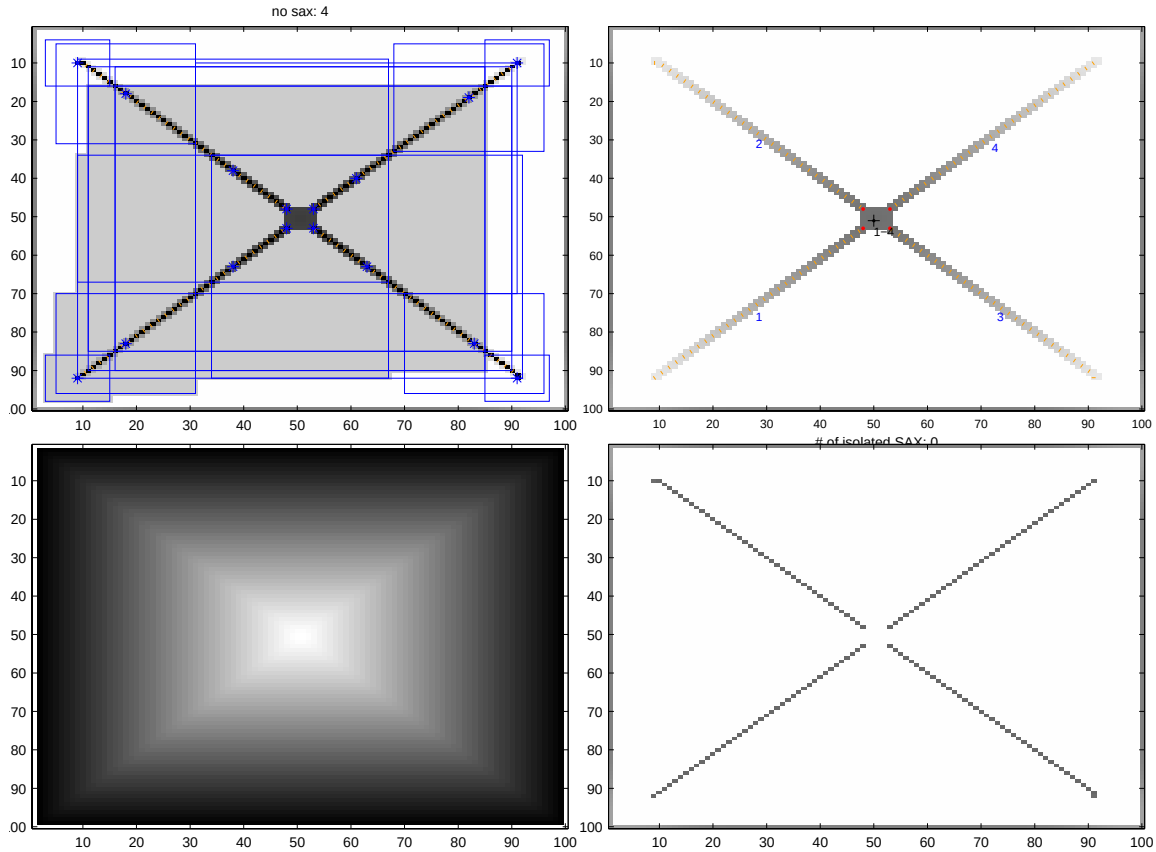


Figure 4: Evolvement for a rectangle (=image borders). **Lower left**: *PF*. **Upper right**: *SF* before thinning (coiled up segments already shown). **Lower right**: *SF* after thinning with intersection point eliminated. **Upper left**: Determining the area for a sym-ax segment (gray shows the area for one diagonal [no. 1]).

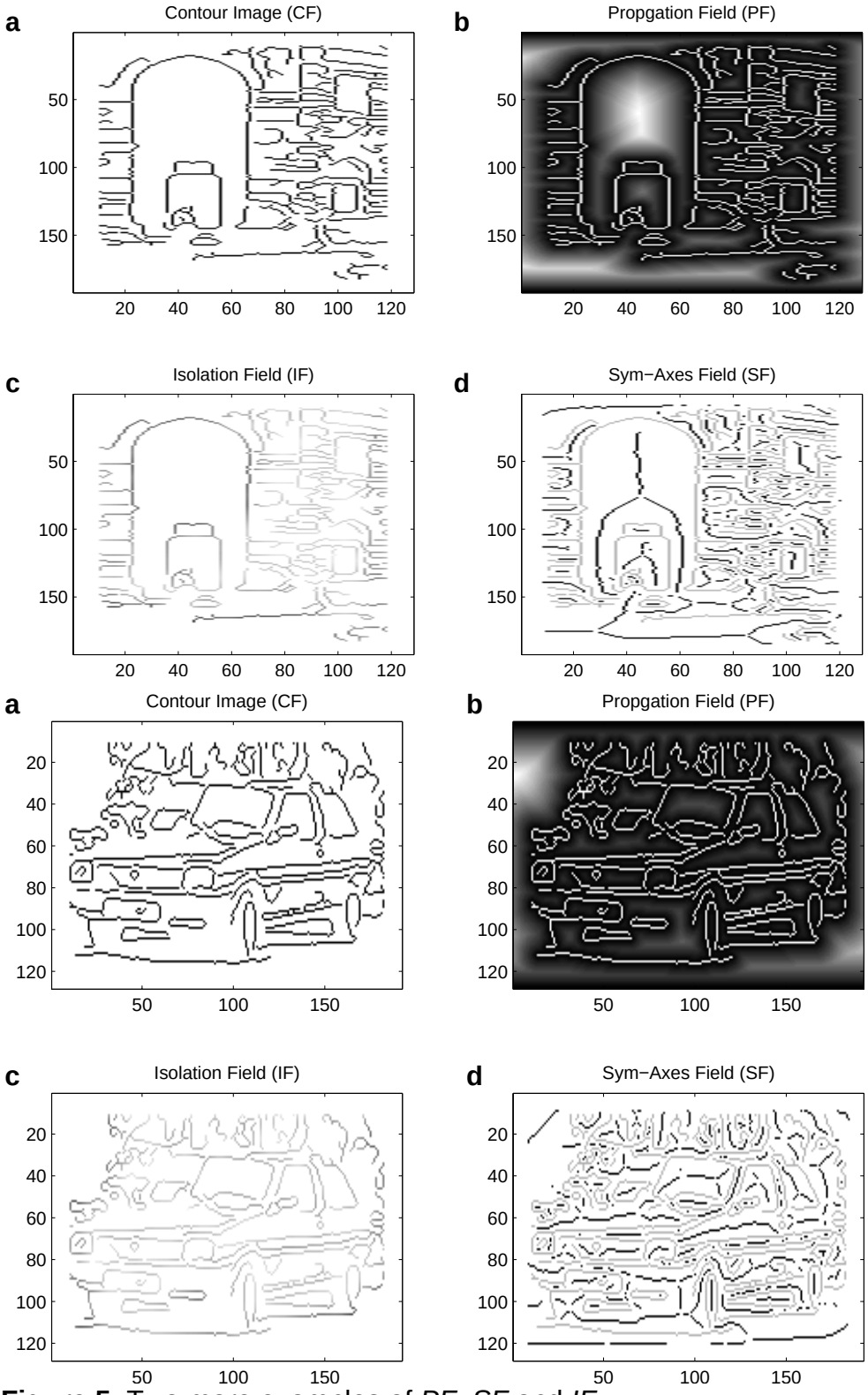


Figure 5. Two more examples of *PF*, *SF* and *IF*.

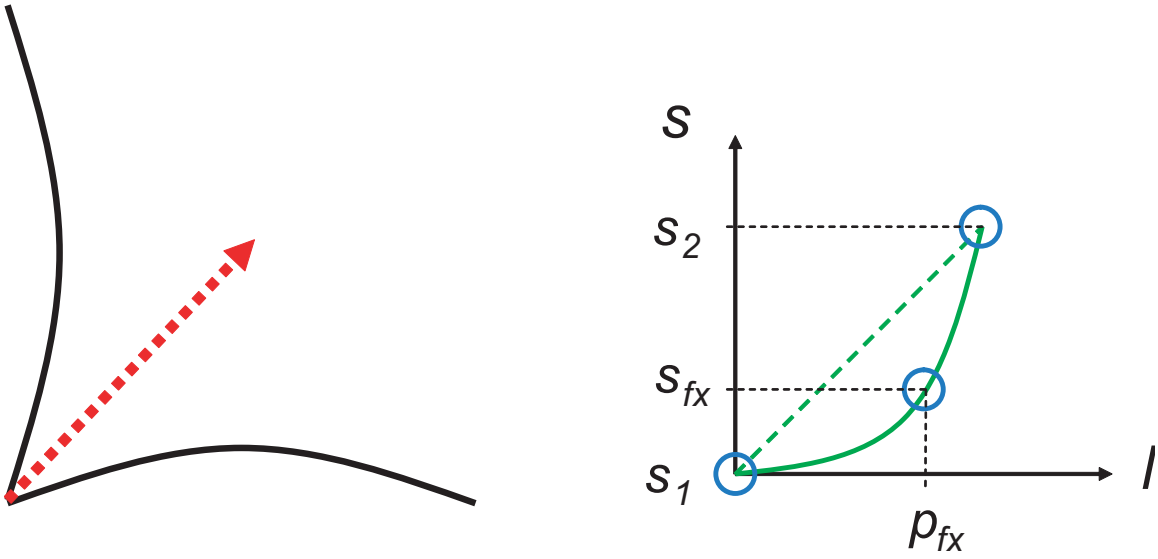


Figure 6: Parameterization of a symmetric-axis segment. **Left**: The symmetric-axis segment (red dotted) for an inward-bent L shape. **Right**: Symmetric signature (solid green): symmetric distance (s) vs. the axis' arc length (l) in the image plane. 4 Parameters are defined: the initial and end distance (s_1 and s_2, respectively) as well as the distance (s_{fx}) and relative location (p_{fx}) of the point where the distance between the symmetric signature from the straight line connecting the signature's endpoints (dashed) is maximal.

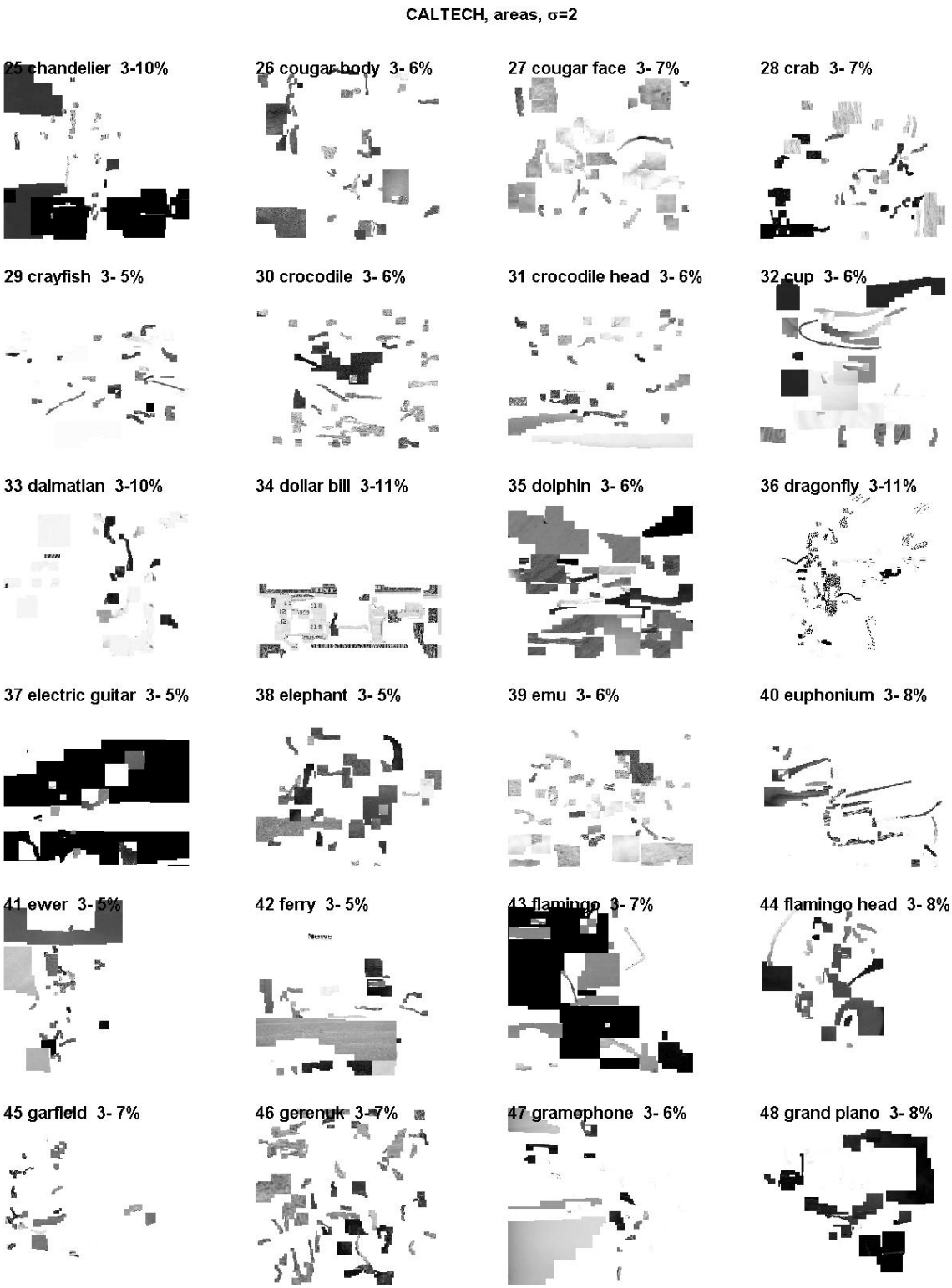


Figure 7. This and the remaining images show the category-specific descriptors for the Caltech collection for scales 2 and 5 (the next 4 and 5 pages respectively).

CALTECH, areas, σ=2

49 hawksbill 3- 5%

50 headphone 3- 5%

51 hedgehog 3-11%

52 helicopter 3- 5%

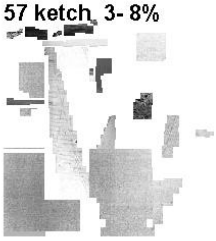
53 ibis 3- 8%

54 inline skate 3- 6%

55 joshua tree 3- 8%

56 kangaroo 3- 7%

57 ketch 3- 8%



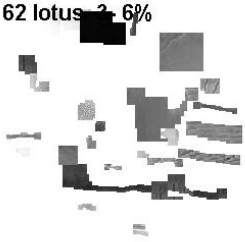
58 lamp 3- 5%

59 laptop 3-14%

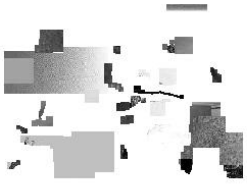
60 llama 3- 7%

61 lobster 3- 7%

62 lotus 3- 6%



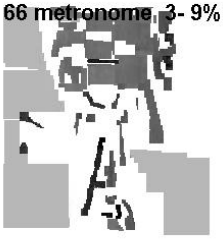
63 mandolin 3- 6%



64 mayfly 3- 6%

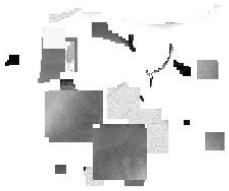
65 menorah 3- 8%

66 metronome 3- 9%



67 minaret 3- 6%

68 nautilus 3- 6%



69 octopus 3-14%

70 okapi 3- 6%

71 pagoda 3- 6%

72 panda 3-12%

CALTECH, areas, σ=2

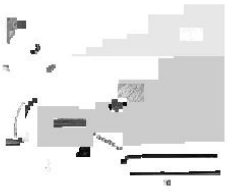
73 pigeon 3- 6%

74 pizza 3- 8%

75 platypus 3-10%

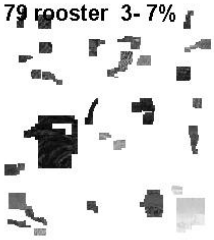
76 pyramid 3- 7%

77 revolver 3- 7%

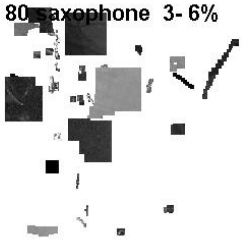


78 rhino 3- 5%

79 rooster 3- 7%



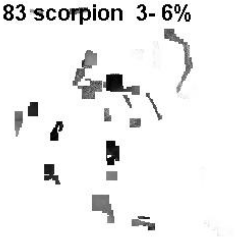
80 saxophone 3- 6%



81 schooner 3- 7%

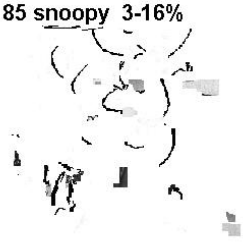
82 scissors 3- 4%

83 scorpion 3- 6%



84 sea horse 3- 5%

85 snoopy 3-16%



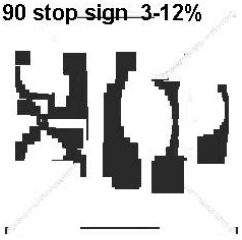
86 soccer ball 3- 7%

87 stapler 3- 7%

88 starfish 3- 8%

89 stegosaurus 3- 7%

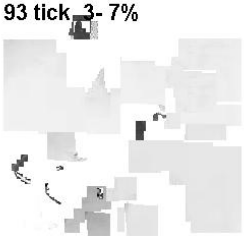
90 stop sign 3-12%



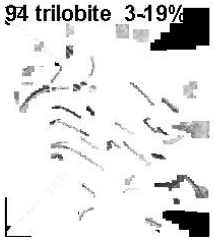
91 strawberry 3- 7%

92 sunflower 3- 7%

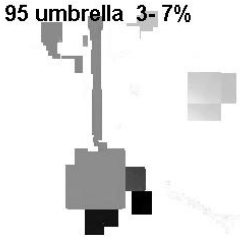
93 tick 3- 7%



94 trilobite 3-19%



95 umbrella 3- 7%



96 watch 3- 5%

CALTECH, areas, σ=2

97 water lilly 3-12%

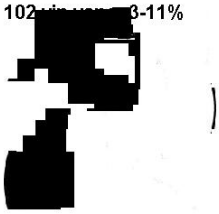
98 wheelchair 3- 6%

99 wild cat 3-11%

100 windsor chair 3-37%

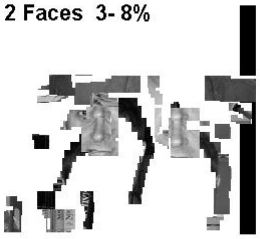
101 wrench 3-11%

102 [illegible] 3-11%



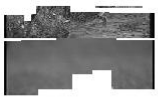
CALTECH, areas, σ=5

2 Faces 3- 8%



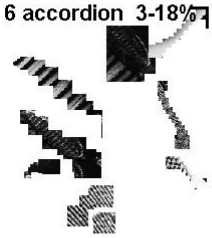
3 Faces easy 3-13%

4 Leopards 4- 4%

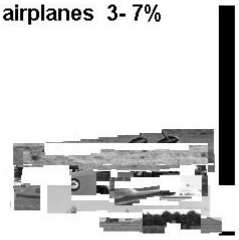


5 Motorbikes 3-11%

6 accordion 3-18%

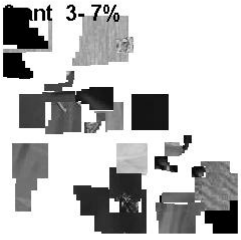


7 airplanes 3- 7%

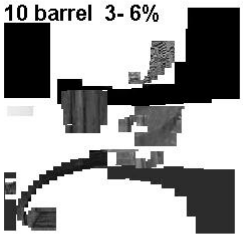


8 anchor 3- 5%

ant 3- 7%

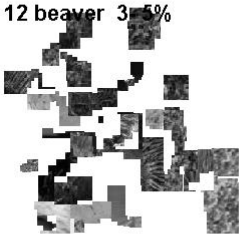


10 barrel 3- 6%



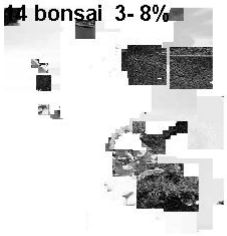
11 bass 3- 3%

12 beaver 3- 5%



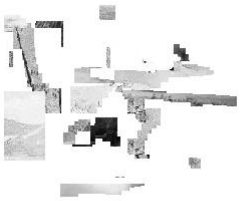
binocular 3- 7%

bonsai 3- 8%

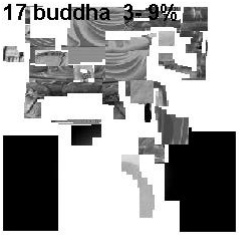


15 brain 3- 7%

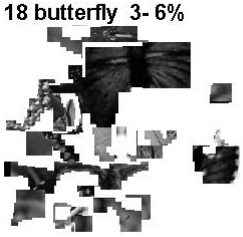
16 brontosaurus 3- 4%



17 buddha 3- 9%

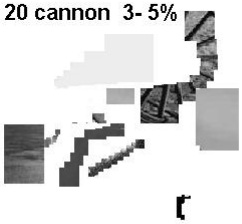


18 butterfly 3- 6%



19 camera 3- 7%

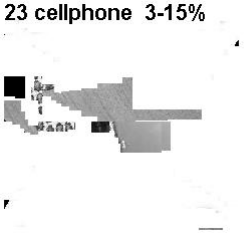
20 cannon 3- 5%



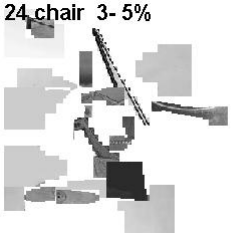
21 car side 3-10%

22 ceiling fan 3- 4%

23 cellphone 3-15%



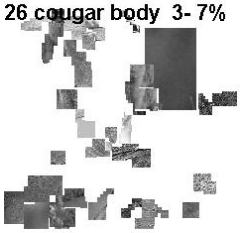
24 chair 3- 5%



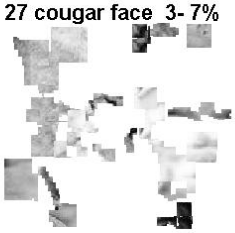
CALTECH, areas, σ=5

25 chandelier 3- 7%

26 cougar body 3- 7%

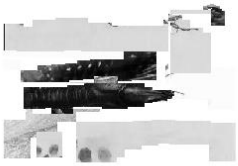


27 cougar face 3- 7%

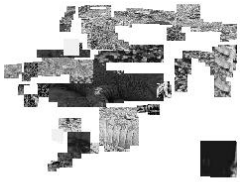


28 crab 3- 6%

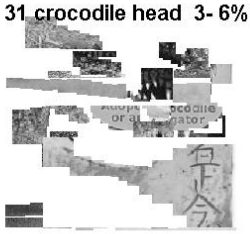
29 crayfish 3- 4%



30 crocodile 3- 7%

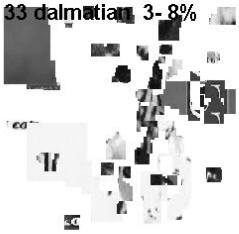


31 crocodile head 3- 6%



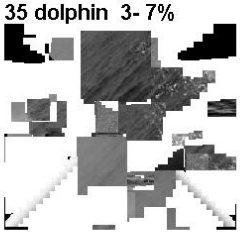
32 cup 3- 8%

33 dalmatian 3- 8%

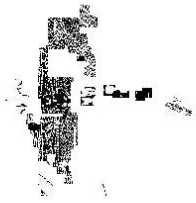


34 dollar bill 3-11%

35 dolphin 3- 7%

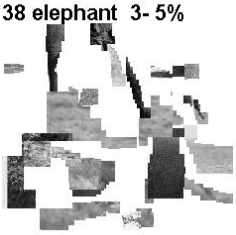


36 dragonfly 3- 8%

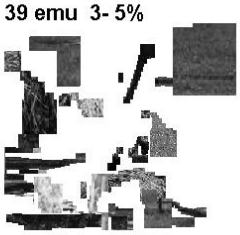


37 electric guitar 3- 5%

38 elephant 3- 5%



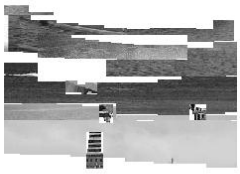
39 emu 3- 5%



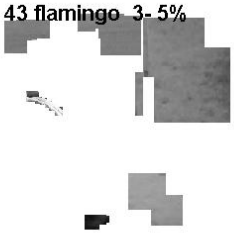
40 euphonium 3- 7%

41 ewer 3- 4%

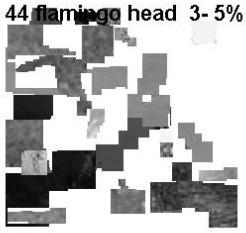
42 ferry 3- 7%



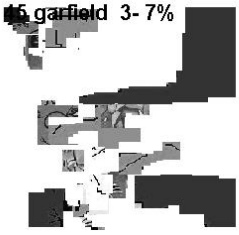
43 flamingo 3- 5%



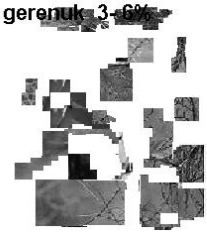
44 flamingo head 3- 5%



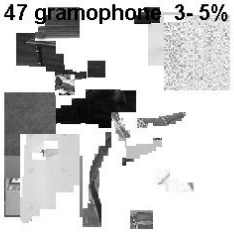
45 garfield 3- 7%



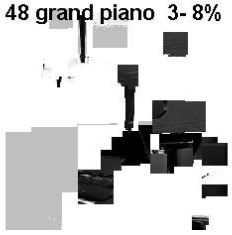
46 gerenuk 3- 6%



47 gramophone 3- 5%



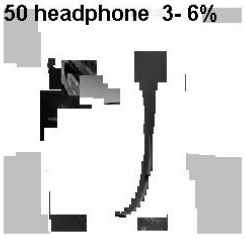
48 grand piano 3- 8%



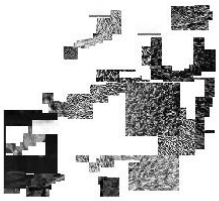
CALTECH, areas, σ=5

49 hawksbill 3- 6%

50 headphone 3- 6%

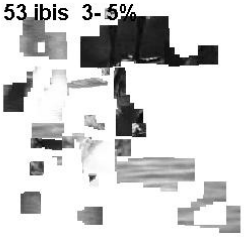


51 hedgehog 3- 8%



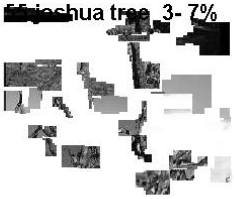
52 helicopter 3- 6%

53 ibis 3- 5%

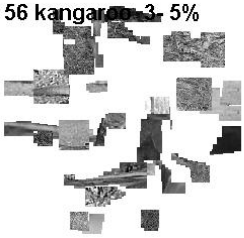


54 inline skate 3- 5%

55 joshua tree 3- 7%

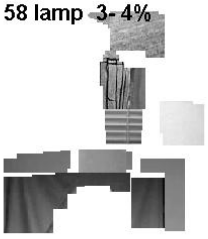


56 kangaroo 3- 5%

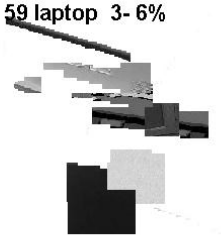


57 ketch 3- 9%

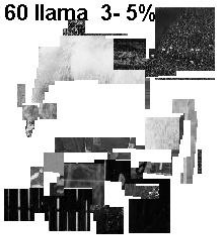
58 lamp 3- 4%



59 laptop 3- 6%

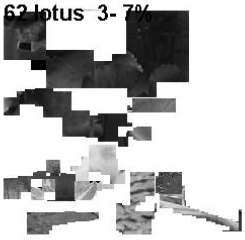


60 llama 3- 5%

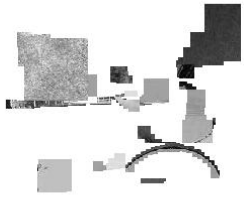


61 lobster 3- 5%

62 lotus 3- 7%

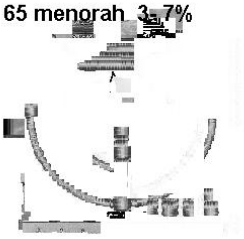


63 mandolin 3- 5%

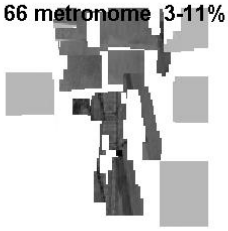


64 mayfly 3- 6%

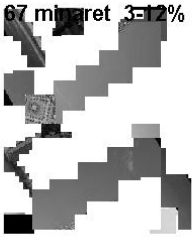
65 menorah 3- 7%



66 metronome 3-11%



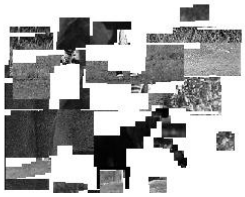
67 minaret 3-12%



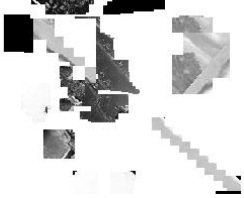
68 nautilus 3- 5%

69 octopus 3-15%

70 okapi 3- 6%



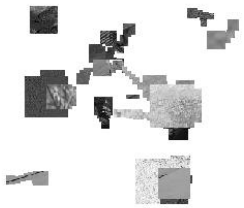
71 pagoda 3-10%



72 panda 3- 5%

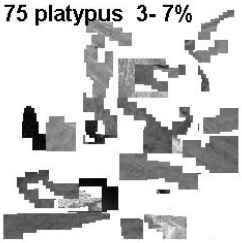
CALTECH, areas, σ=5

73 pigeon 3- 5%

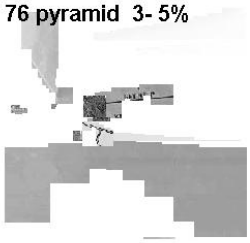


74 pizza 3- 8%

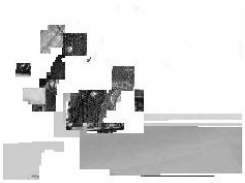
75 platypus 3- 7%



76 pyramid 3- 5%

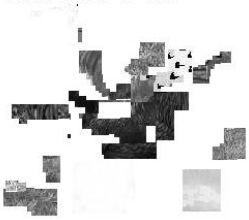


77 revolver 3- 6%

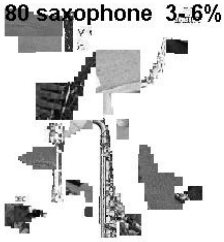


78 rhino 3- 4%

79 rooster 3- 6%



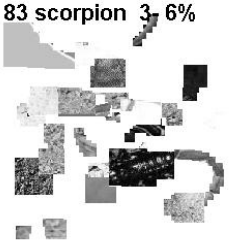
80 saxophone 3- 6%



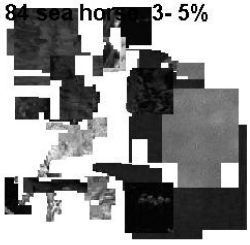
81 schooner 3- 5%

82 scissors 3- 6%

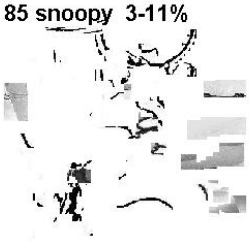
83 scorpion 3- 6%



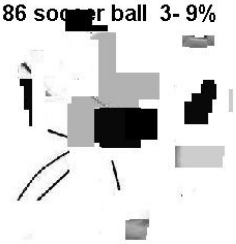
84 sea horse 3- 5%



85 snoopy 3-11%

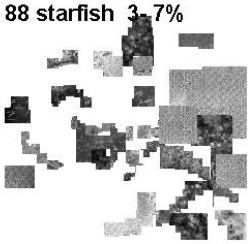


86 soccer ball 3- 9%



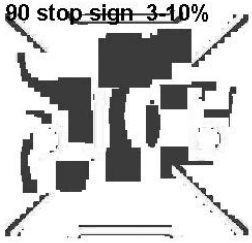
87 stapler 3- 5%

88 starfish 3- 7%

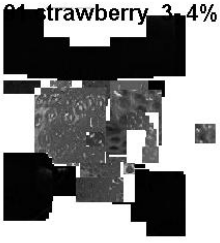


89 stegosaurus 3- 5%

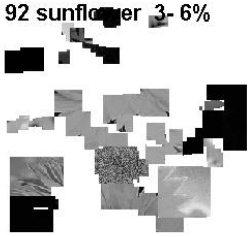
90 stop sign 3-10%



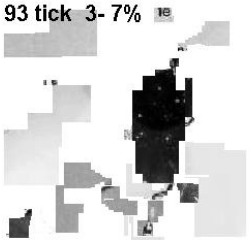
91 strawberry 3- 4%



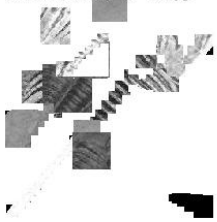
92 sunflower 3- 6%



93 tick 3- 7%

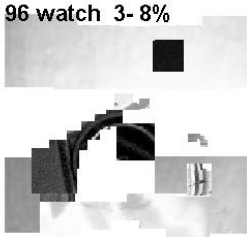


94 trilobite 3-16%



95 umbrella 3- 7%

96 watch 3- 8%



CALTECH, areas, σ=5

97 water lilly 3- 8%

98 wheelchair 3- 9%

99 wild cat 3- 6%

100 windsor chair 3- 6%

101 wrench 3-12%

102 [illegible] 3-13%