РАСПОЗНАВАНИЕ ОБРАЗОВ НА ОСНОВЕ ВЫЧИСЛЕНИЯ ИНВАРИАНТНЫХ МОМЕНТОВ ИЗОБРАЖЕНИЙ

"Calculus descriptor" (*S.Chang and H.Arsenault, 1994*):

$$CD = \iint_\Omega \Delta t(x,y) \cdot t(x,y)\, dx\, dy$$

Пример использования: анализ изображений летательных аппаратов:
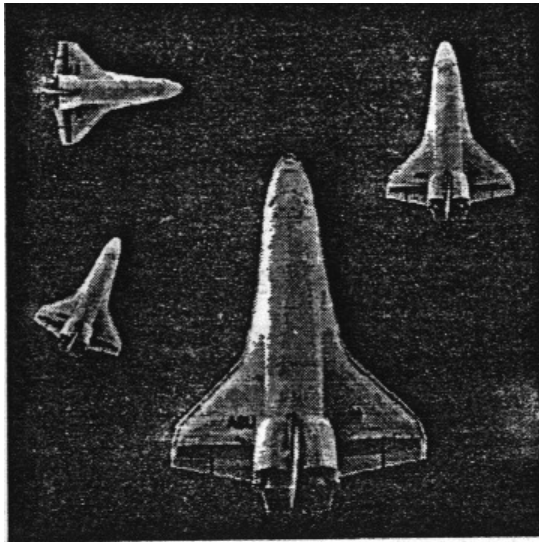

Fig. 2 Four space shuttles with different sizes and orientations. The largest space shuttle, named s2 (scale factor = 2) in Table 1, has size 512×512 pixels; the top right one, s1 (scale factor = 1) in Table 1, is the reference with size 256×256; the other two are s0.8 (scale factor = 0.8), size 204×204, and s0.7 (scale factor = 0.7), size 179×179.
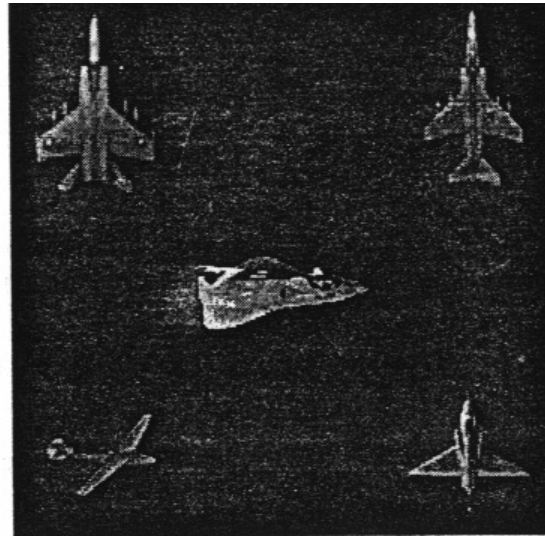

Fig. 3 Five aircraft, all 128×128. From left to right, top to bottom, they are m25, jag, f19, plane, f102.

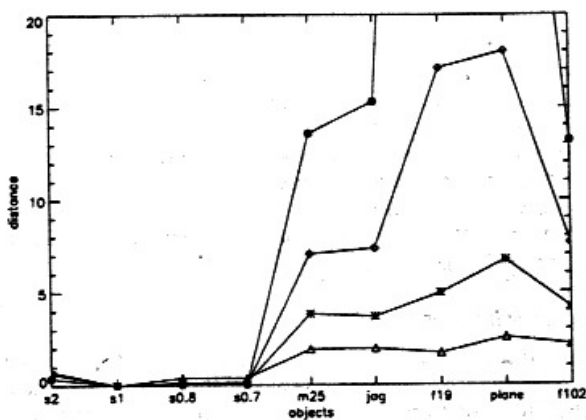| объект	s2	s1	s0.8	s0.7	m25	jag	f19	plane	f102
CD	1.00	0.84	0.76	0.76	0.44	0.43	1.2	0.3	0.39

Fig. 5 The histogram of recognition results on nine aircraft, where ● denotes the result based on a four-component vector, ◇ denotes the result based on a three-component vector, * denotes the result based on a two-component vector, and △ denotes the result based on a one-component vector, i.e., a single CD value.

Улучшение дискриминации при увеличении количества компонент *CD*-вектора.

$$CD_i = \iint_\Omega \Delta F_i[t(x,y)] \cdot G_i[t(x,y)]\, dx\, dy$$