Visibility diagrams for corner transitions

The diagrams below illustrate the FC and SFC corner transitions referred to in (3.2)(6), figure 3, (4.1)(4), (4.3) and figure 17 of the article *Local image features resulting from 3-dimensional geometric features, illumination and movement: II.* The diagrams include indications of visibility of the contours, features and cast shadows. For the 'type' notation, see (3.1) of the cited article.

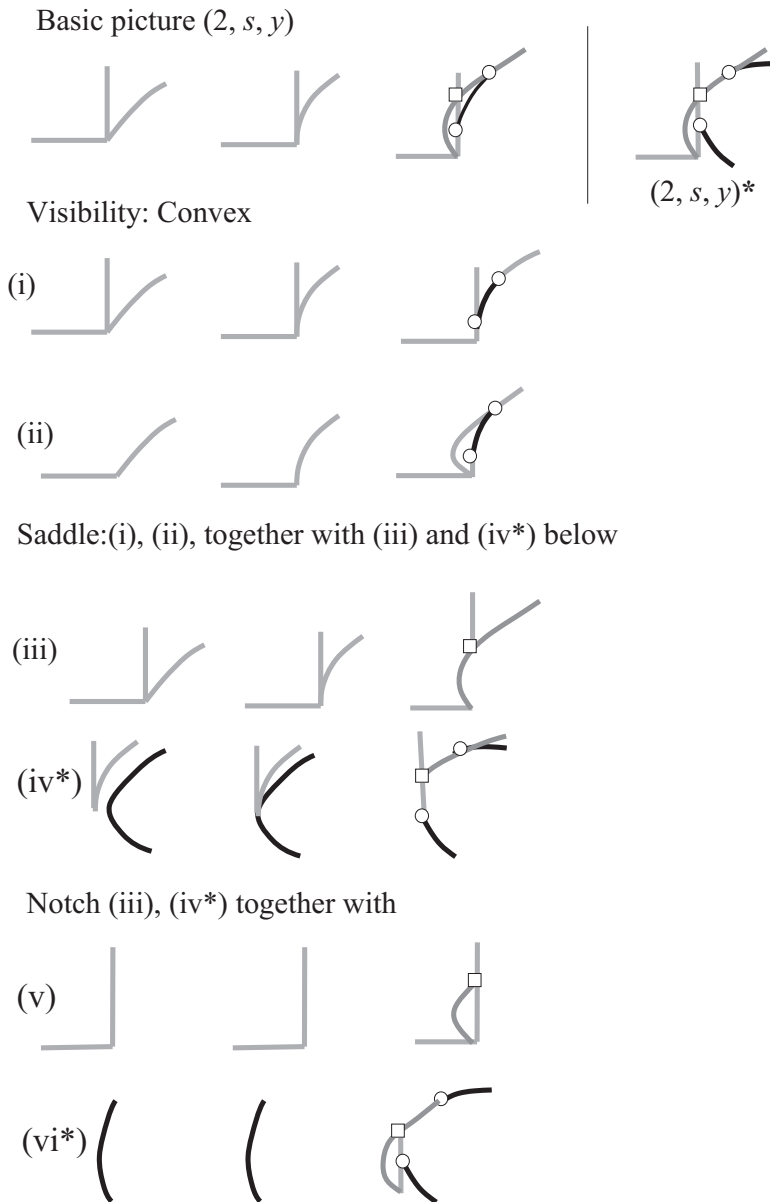# 1 Corner transitions by type and visibility, without cast shadows

Basic picture $(2, s, y)$

$(2, s, y)*$

Visibility: Convex

(i)

(ii)

Saddle:(i), (ii), together with (iii) and (iv*) below

(iii)

(iv*)

Notch (iii), (iv*) together with

(v)

(vi*)

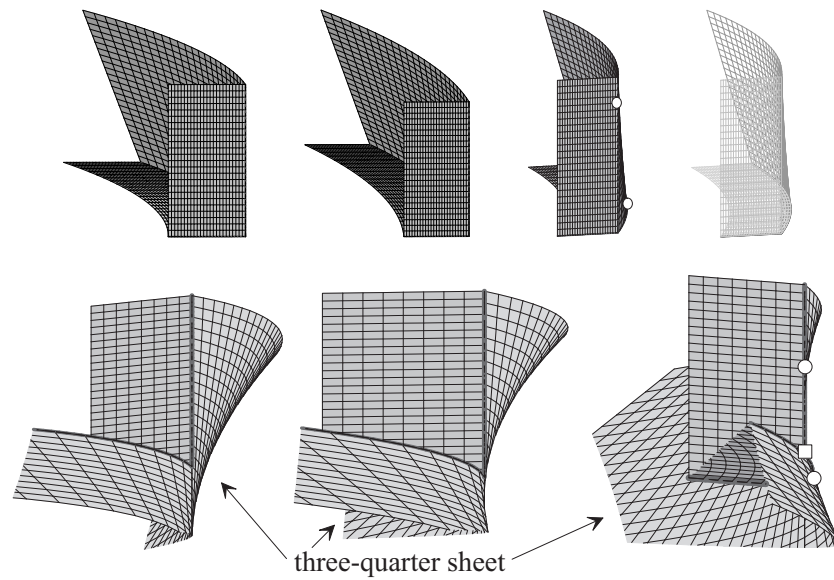Figure 1: Transitions on corners of type $(2, s, y)$

three-quarter sheet

Figure 2: Top row: a transition on a convex corner of type $(2, s, y)$(ii). Note that it is the arrangement of crease edges and contour which is important, not their shapes, when comparing actual examples with the schematic diagrams. The right-hand figure is a wireframe view of the figure to its left, showing the occluded self-intersection of creases in the image. Bottom row: transition on a notch corner of type $(2, s, y)$(iv*).
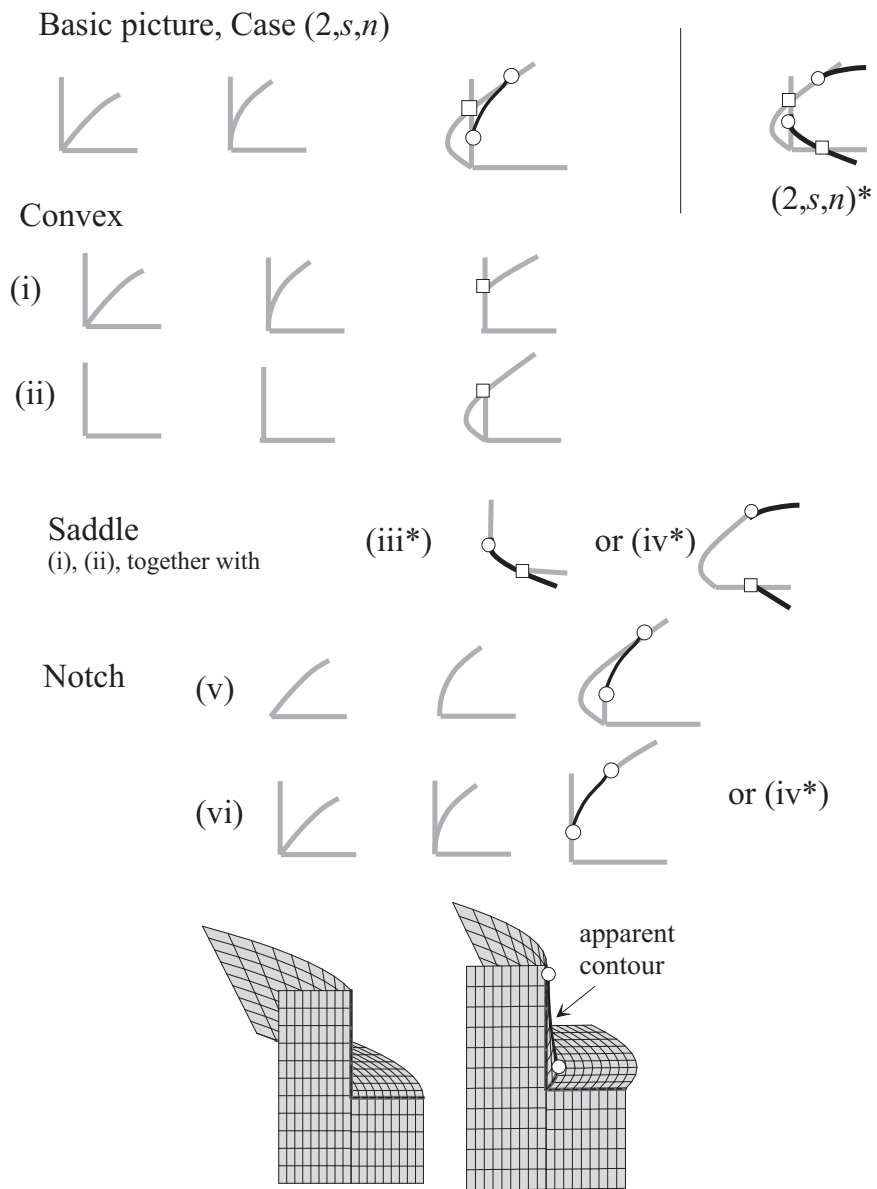
Basic picture, Case (2,*s,n*)

Convex

(i)

(ii)

(2,*s,n*)*

Saddle
(i), (ii), together with   (iii*)   or (iv*)

Notch   (v)

(vi)   or (iv*)

apparent
contour

Figure 3: Transitions on corners of type $(2, s, n)$; bottom row: type $(2, s, n)(v)$

Basic picture, (2,*o*,*n*)

(2,*o*,*n*)*

Visibility:

Convex (i)

Concave (ii)

Saddle (iii*)

Notch: (i*), (ii)
or (iv)
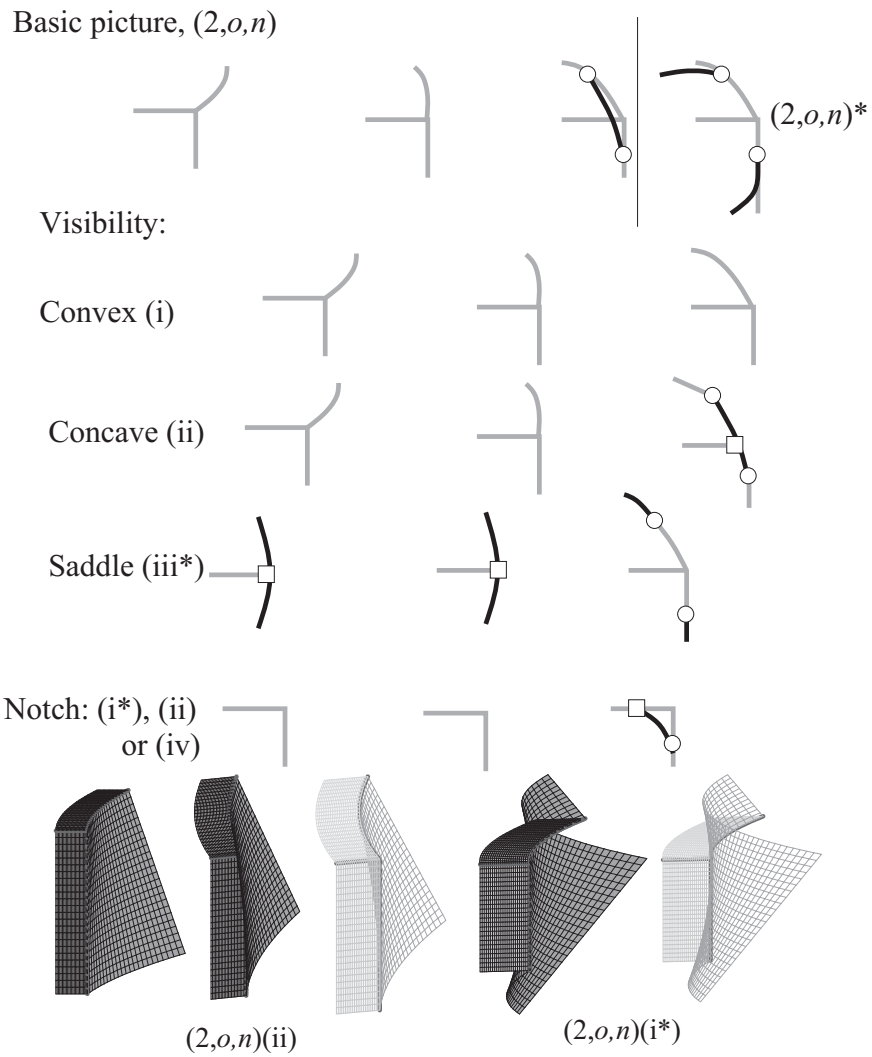
(2,*o*,*n*)(ii)

(2,*o*,*n*)(i*)

Figure 4: Transitions on corners of type $(2, o, n)$. Bottom row: the first three figures are concave type $(2, o, n)$(ii) with the third a wireframe view of the figure to its left. The fourth figure is a notch of type $(2, o, n)$(i*) where the contour is completely hidden, but shown in the wireframe figure to its right.
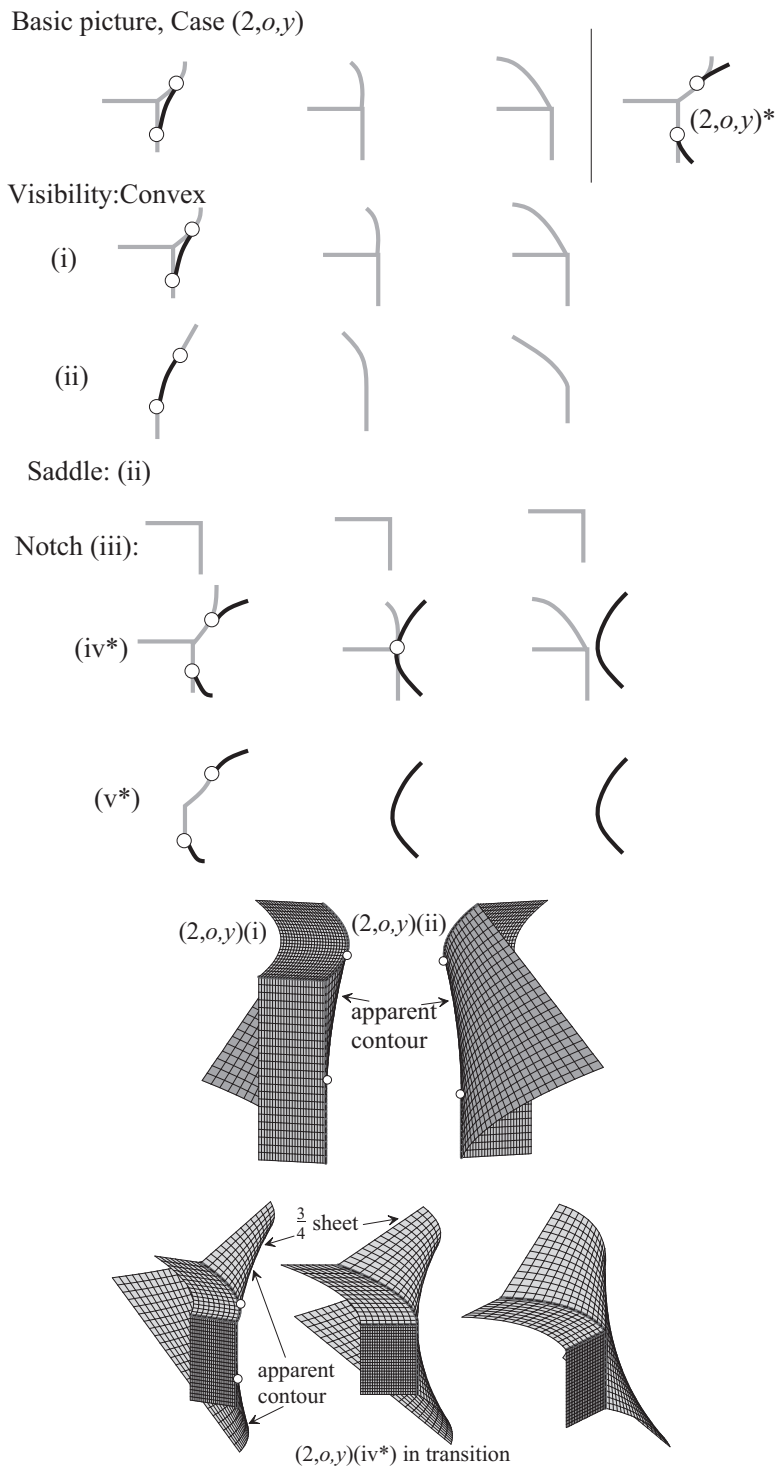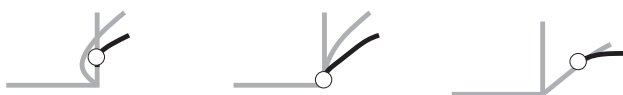
Basic picture, Case (2,*o*,*y*)

(2,*o*,*y*)*

Visibility:Convex

(i)

(ii)

Saddle: (ii)

Notch (iii):

(iv*)

(v*)

(2,*o*,*y*)(i) (2,*o*,*y*)(ii)

apparent
contour

$\frac{3}{4}$ sheet

apparent
contour

(2,*o*,*y*)(iv*) in transition

Figure 5: Transitions on corners of type $(2, o, y)$

Basic picture, (1,*s*,*y*)

Visibility: Convex
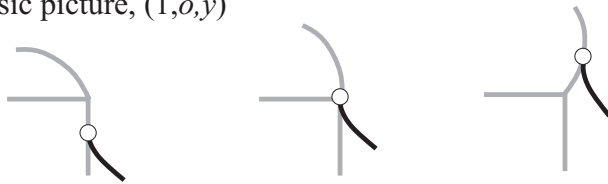
(i)

(ii)
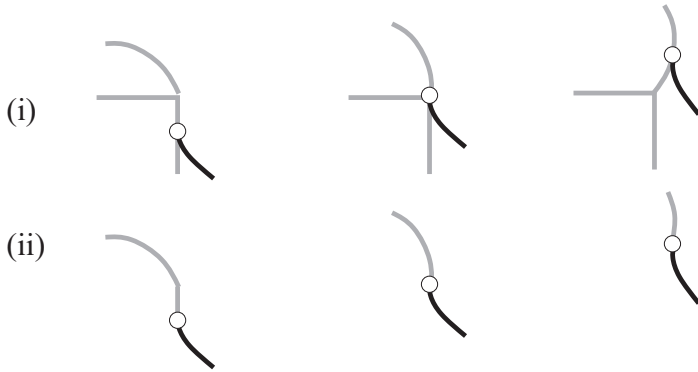
Saddle: (i), (ii)

Notch (iii)

(iv)

(v*)

(vi*)

Figure 6: Transitions on corners of type $(1, s, y)$

Basic picture, (1,*o,y*)

Visibility: Convex
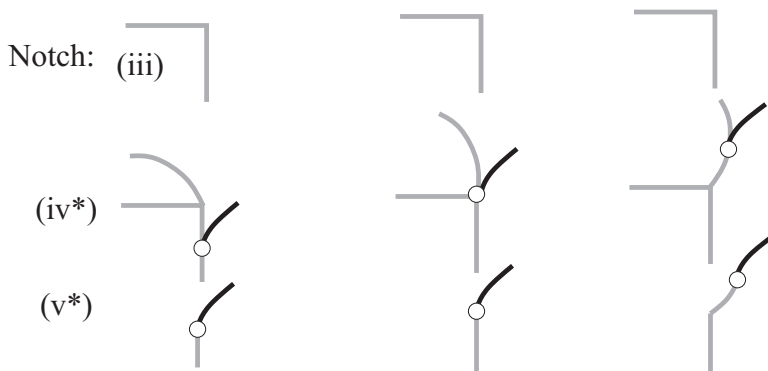
(i)

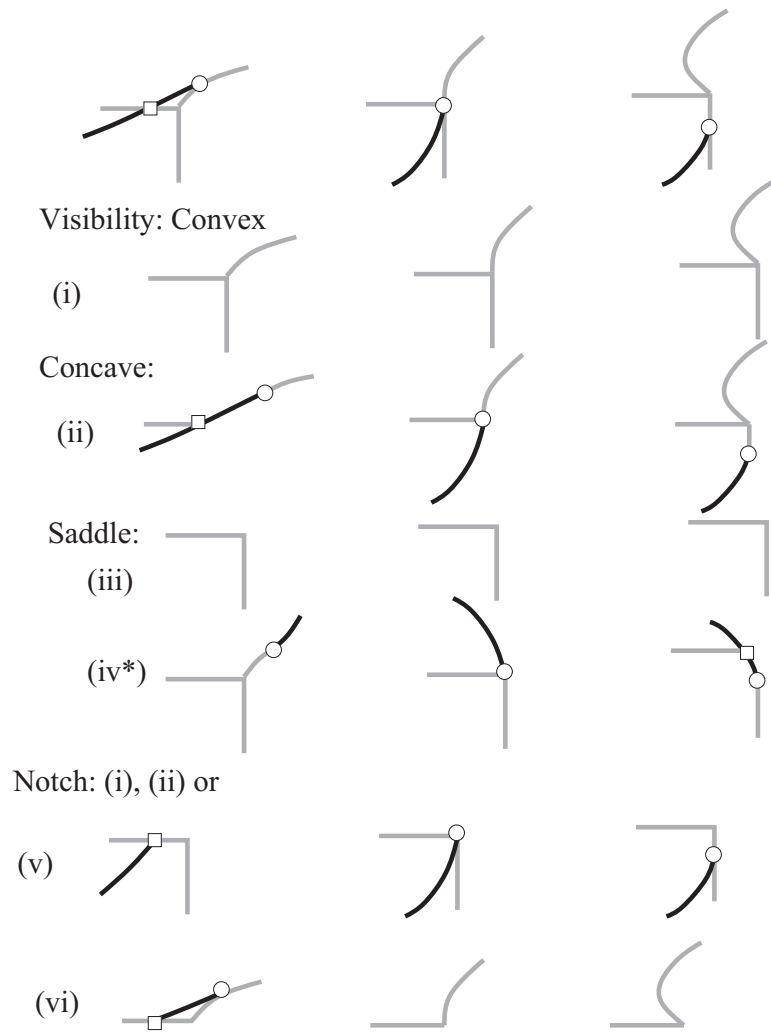(ii)

Saddle: (ii)

Notch: (iii)

(iv*)

(v*)

Figure 7: Transitions on corners of type $(1, o, y)$. Note that in this case there is in fact no qualitative distinction between the starred and unstarred cases.

Basic picture, (1,*o*,*n*)

Visibility: Convex

(i)

Concave:

(ii)

Saddle:

(iii)
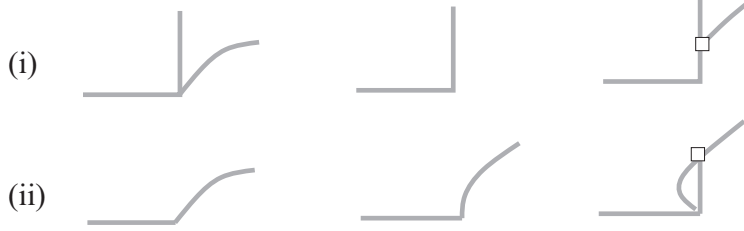
(iv*)

Notch: (i), (ii) or

(v)

(vi)

Figure 8: Transitions on corners of type $(1, o, n)$. Note that in this case there is in fact no qualitative distinction between the starred and unstarred cases.

Basic picture, (1*s,n*)

Visibility: Convex:

(i)

(ii)

Saddle: (i), (ii) or

(iii*)

Notch:

(iv)
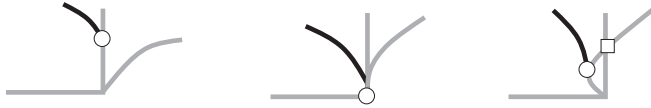
Figure 9: Transitions on corners of type $(1, s, n)$

2 Corners and cast shadows: notch cases

CS

(2,*s*,*y*),(iii)

CS
Cr

(2,*s*,*n*),(iii)

CS

AC

(Hidden parts of shadow and
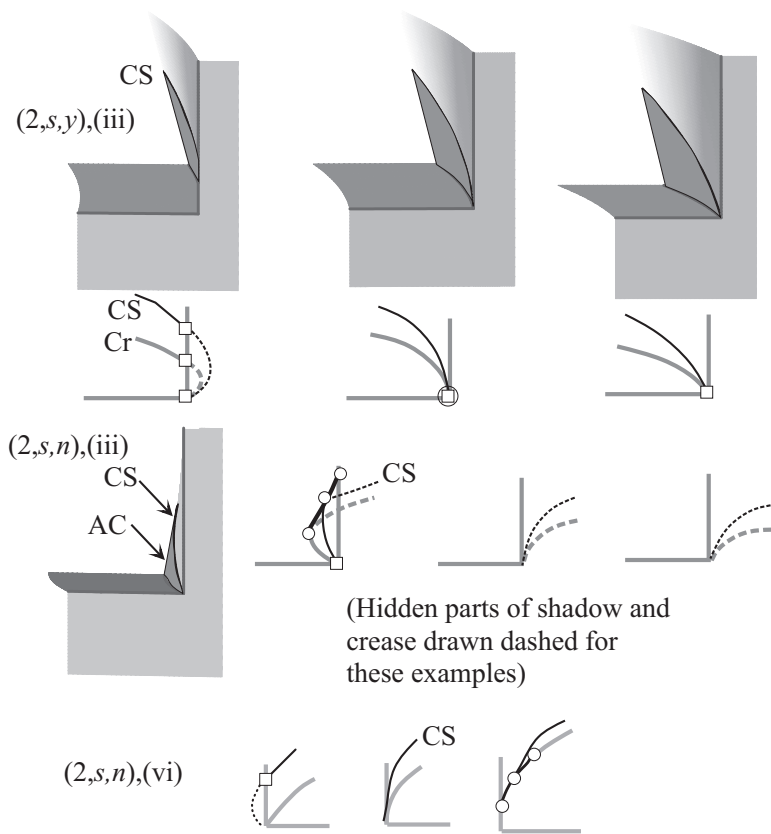crease drawn dashed for
these examples)

CS

(2,*s*,*n*),(vi)

Figure 10: Two examples of notch corners with cast shadow transitions and a schematic picture.
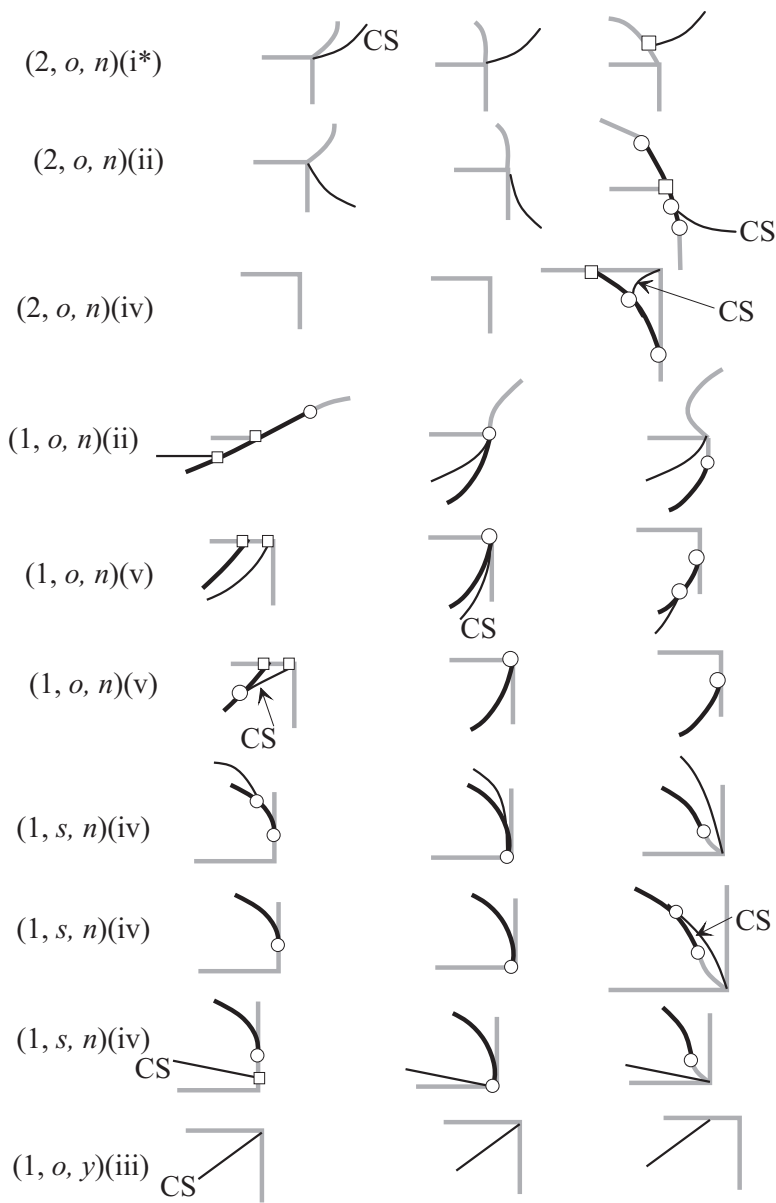CS = cast shadow of a crease

Figure 11: Schematic pictures of the remaining notch corners with cast shadow transitions. CS = cast shadow of a crease

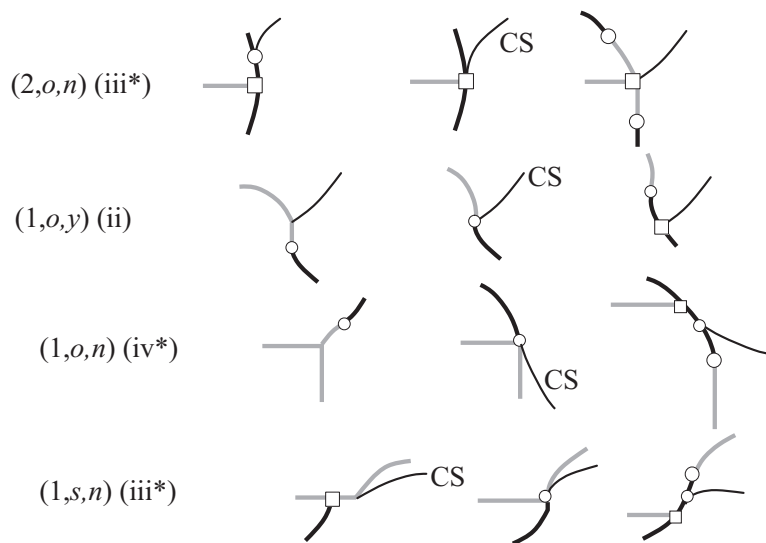# 3 Corners and cast shadows: saddle cases. CS = cast shadow of a crease

Figure 12: Schematic pictures of saddle corners with cast shadow transitions