File created: 3-Sep-86 22:07:11 **{ERIS}<LISPCORE>LIBRARY>COLORPOLYGONS.;4**

changes to: (FNS MOTIONIT COLORPOLYGONS.ROTATECOLORMAP)

previous date: 6-Jun-86 00:35:47 {ERIS}<LISPCORE>LIBRARY>COLORPOLYGONS.;2

Read Table: OLD-INTERLISP-FILE

Package: INTERLISP

Format: XCCS


```
(RPAQQ COLORPOLYGONSCOMS
       ((FNS COLORPOLYGONS COLORPOLYGON COLORPOLYGONS.ROTATECOLORMAP)
        (FNS BLACKHOLE BLACKHOLE1 COLORCONNECTPOLYS COLORDRAWPOLY1 DRAWCOLORPOLYSTEPS LENSE LINETEST MAPIT
             MAPIT2 MOTIONIT ONECOLORPOLY RANDOMPT)
        (INITVARS (MOTIONMAP)
               (ONEMAP)
               (PRETTYMAP))
        (VARS MOTIONMAPCOLORS ONEMAPCOLORS PRETTYCOLORS)))

(DEFINEQ

(COLORPOLYGONS
  [LAMBDA (DS)                                                    (* kbr: " 6-Jun-86 00:16")
    (PROG (BITSPERPIXEL NPTS)
          (COND
             ((NULL DS)
              (SETQ DS (DSPCREATE (COLORSCREENBITMAP)))
              (DSPCLIPPINGREGION (LIST 0 0 (BITMAPWIDTH (COLORSCREENBITMAP))
                                       (BITMAPHEIGHT (COLORSCREENBITMAP)))
                     DS)))
      LP  (COLORPOLYGON DS)
          (COLORPOLYGONS.ROTATECOLORMAP)
          (GO LP])

(COLORPOLYGON
  [LAMBDA (DS)                                                    (* kbr: " 6-Jun-86 00:10")
    (PROG (NPTS)
          (COLORCONNECTPOLYS (for I from 1 to (SETQ NPTS (RAND 3 8)) collect (RANDOMPT DS))
                 (for I from 1 to NPTS collect (RANDOMPT DS))
                 (ITIMES 15 (RAND 3 4))
                 T 1 1 15 8 DS])

(COLORPOLYGONS.ROTATECOLORMAP
  [LAMBDA NIL                                                     (* kbr: " 3-Sep-86 21:31")
    (PROG (BITSPERPIXEL)
          (SETQ BITSPERPIXEL (BITSPERPIXEL (COLORSCREENBITMAP)))
          (COND
             ((EQ BITSPERPIXEL 4)
              (OR MOTIONMAP (SETQ MOTIONMAP (COLORMAPCREATE MOTIONMAPCOLORS BITSPERPIXEL)))
              (OR PRETTYMAP (SETQ PRETTYMAP (COLORMAPCREATE PRETTYCOLORS BITSPERPIXEL)))
              (SETQ WAITTIME 70))
             (T (OR MOTIONMAP (SETQ MOTIONMAP
                                    (COLORMAPCREATE [for I from 1 to 8
                                                       join (NCONC (for J from 0 to 255 by 8
                                                                      collect (LIST 0 0 J))
                                                                   (for J from 1 to 8
                                                                      collect (QUOTE (128 128 128]
                                                    BITSPERPIXEL)))
                   (OR PRETTYMAP (SETQ PRETTYMAP (RAINBOWMAP 8)))
                   (SETQ WAITTIME 20)))
          (SCREENCOLORMAP MOTIONMAP)
          (CD.QUITP 40)
          (until (CD.QUITP) do (ROTATECOLORMAP 1))
          (SCREENCOLORMAP PRETTYMAP)
          (CD.QUITP 40)
          (until (CD.QUITP) do (ROTATECOLORMAP 1)
                               (DISMISS WAITTIME])

)

(DEFINEQ

(BLACKHOLE
  [LAMBDA (PTLST DS DENSITY PERCENT)                              (* kbr: " 5-Jun-86 23:45")
                                                                  (* maps a list of points onto itself repeatedly until closure)
    (PROG NIL
          (DSPFILL NIL NIL 0 DS)
          (BLACKHOLE1 PTLST DS (OR DENSITY 3)
                 (OR PERCENT 30])
```

(BLACKHOLE1

```
[LAMBDA (PTLST DS DENSITY PERCENT)                                    (* kbr: " 5-Jun-86 23:46")
                                                                      (* maps a list of points onto itself repeatedly until closure)
   (PROG (CENTERX CENTERY X Y OTHERPTS)
         (SETQ CENTERX (IQUOTIENT (for PT in PTLST sum (fetch (POSITION XCOORD) of PT))
                                  (LENGTH PTLST)))
         (SETQ CENTERY (IQUOTIENT (for PT in PTLST sum (fetch (POSITION YCOORD) of PT))
                                  (LENGTH PTLST)))                    (* make another polygon that is 80%% of the way to the edge.)
         [SETQ OTHERPTS (for PT in PTLST collect (create POSITION
                                                         XCOORD _ [COND
                                                                     ((IGREATERP (SETQ X (fetch (POSITION XCOORD)
                                                                                            of PT))
                                                                                 CENTERX)
                                                                      (IPLUS CENTERX (IQUOTIENT (ITIMES
                                                                                                 PERCENT
                                                                                                 (IDIFFERENCE X
                                                                                                        CENTERX))
                                                                                                100)))
                                                                     (T (IDIFFERENCE CENTERX
                                                                              (IQUOTIENT (ITIMES PERCENT
                                                                                                 (IDIFFERENCE
                                                                                                        CENTERX X))
                                                                                         100]
                                                         YCOORD _ (COND
                                                                     ((IGREATERP (SETQ Y (fetch (POSITION YCOORD)
                                                                                            of PT))
                                                                                 CENTERY)
                                                                      (IPLUS CENTERY (IQUOTIENT (ITIMES
                                                                                                 PERCENT
                                                                                                 (IDIFFERENCE Y
                                                                                                        CENTERY))
                                                                                                100)))
                                                                     (T (IDIFFERENCE CENTERY
                                                                              (IQUOTIENT (ITIMES PERCENT
                                                                                                 (IDIFFERENCE
                                                                                                        CENTERY Y))
                                                                                         100]
                                                                      (* make sure the number of steps is integral to number of colors.)
                                                                      (* draw from the outer one into the inner one, shifted by one)
         (DRAWCOLORPOLYSTEPS PTLST [SETQ OTHERPTS (APPEND (CDR OTHERPTS)
                                                          (LIST (CAR OTHERPTS]
                (ITIMES (OR DENSITY 3)
                        15)
                T 1 (MAXIMUMCOLOR)
                DS)
         (COND
            ((AND (for PT in OTHERPTS thereis (IGREATERP (ABS (IDIFFERENCE CENTERX (fetch (POSITION XCOORD)
                                                                                          of PT)))
                                                         20))
                  (for PT in OTHERPTS thereis (IGREATERP (ABS (IDIFFERENCE CENTERY (fetch (POSITION YCOORD)
                                                                                          of PT)))
                                                         20)))
             (BLACKHOLE1 OTHERPTS DS (ADD1 DENSITY)
                    PERCENT])
```

(COLORCONNECTPOLYS

```
[LAMBDA (FROMS TOS NSTEPS CONNECTEDFLG INCOLOR? FROMCOLOR TOCOLOR TWEENCOLOR DS)
                                                                      (* kbr: " 6-Jun-86 00:03")

   (* draws the source and destination polygons and shows the track taken by the sides;
   then leaves the trace of the polygon in tranformation)

   (SETQ LASTPOLYGONFROMS FROMS)
   (SETQ LASTPOLYGONTOS TOS)
   (ERSETQ (PROG NIL
                 (DSPFILL NIL NIL NIL DS)
                 (COLORDRAWPOLY1 FROMS 1 CONNECTEDFLG (OR FROMCOLOR INCOLOR?)
                        DS)
                 (COLORDRAWPOLY1 TOS 1 CONNECTEDFLG (OR TOCOLOR INCOLOR?)
                        DS)
                 [SETQ DIFFS (for FPT in FROMS as TPT in TOS do (DRAWBETWEEN FPT TPT 1 NIL DS (OR TWEENCOLOR 15]
                 (DISMISS 1500)
                 (DSPFILL NIL NIL NIL DS)
                 (DRAWCOLORPOLYSTEPS FROMS TOS NSTEPS CONNECTEDFLG INCOLOR? TOCOLOR DS])
```

(COLORDRAWPOLY1

```
[LAMBDA (PTLIST WIDTH CONNECT? COLOR DS)                              (* rrb "11-OCT-82 11:43")
                                                                      (* draws a closed polygon of the points given)
   [COND
      (PTLIST (for PTA in PTLIST as PTB in (CDR PTLIST) do (DRAWBETWEEN PTA PTB WIDTH (DSPOPERATION NIL DS)
                                                                        DS
                                                                        (COND
                                                                           [(LISTP COLOR)
                                                                      (* COLOR can be a list of colors for each side.)
                                                                            (PROG1 (CAR COLOR)
```

```
                                                                    [SETQ COLOR (COND
                                                                                ((CDR COLOR))
                                                                                (T (CAR COLOR])]
                                                                  (T COLOR)))
                finally (AND CONNECT? (DRAWBETWEEN (CAR (LAST PTLIST))
                                                   (CAR PTLIST)
                                                   WIDTH
                                                   (DSPOPERATION NIL DS)
                                                   DS
                                                   (COND
                                                      [(LISTP COLOR)
                                                       (PROG1 (CAR COLOR)
                                                           [SETQ COLOR (COND
                                                                         ((CDR COLOR))
                                                                         (T (CAR COLOR])]
                                                      (T COLOR)))
                                DS]
    (BLOCK])
```

(DRAWCOLORPOLYSTEPS

```
  [LAMBDA (FROMS TOS NSTEPS CONNECTEDFLG FROMCOLOR MAXCOLOR DS)  (* rrb "15-OCT-82 14:47")
    (PROG (DIFFS XFROMS)
          (SETQ XFROMS (COPY FROMS))
          [SETQ DIFFS (for FPT in XFROMS as TPT in TOS collect (create POSITION
                                                                       XCOORD _ (IDIFFERENCE (fetch (POSITION XCOORD)
                                                                                                 of TPT)
                                                                                             (fetch (POSITION XCOORD)
                                                                                                of FPT))
                                                                       YCOORD _ (IDIFFERENCE (fetch (POSITION YCOORD)
                                                                                                 of TPT)
                                                                                             (fetch (POSITION YCOORD)
                                                                                                of FPT]
          (for I from 1 to NSTEPS do (COLORDRAWPOLY1 XFROMS 1 CONNECTEDFLG (COND
                                                                             [(FIXP FROMCOLOR)
                                                                              (COND
                                                                                 ((IGREATERP FROMCOLOR
                                                                                             MAXCOLOR)
                                                                                  (SETQ FROMCOLOR 1)))
                                                                              (PROG1 FROMCOLOR
                                                                                  (SETQ FROMCOLOR (ADD1
                                                                                                    FROMCOLOR
                                                                                                    ))))]
                                                                            (T FROMCOLOR))
                                                    DS)
                                    [for PT in XFROMS as DIF in DIFFS as FROMPT in FROMS
                                       do (replace (POSITION XCOORD) of PT
                                             with (IPLUS (fetch (POSITION XCOORD) of FROMPT)
                                                         (IQUOTIENT (ITIMES (fetch (POSITION XCOORD) of DIF)
                                                                            I)
                                                                    NSTEPS)))
                                          (replace (POSITION YCOORD) of PT
                                             with (IPLUS (fetch (POSITION YCOORD) of FROMPT)
                                                         (IQUOTIENT (ITIMES (fetch (POSITION YCOORD) of DIF)
                                                                            I)
                                                                    NSTEPS]
            finally (COLORDRAWPOLY1 XFROMS 1 CONNECTEDFLG (COND
                                                            [(FIXP FROMCOLOR)
                                                             (COND
                                                                ((IGREATERP FROMCOLOR MAXCOLOR)
                                                                 (SETQ FROMCOLOR 1)))
                                                             (PROG1 FROMCOLOR
                                                                 (SETQ FROMCOLOR (ADD1 FROMCOLOR)))]
                                                            (T FROMCOLOR))
                                    DS))
          (RETURN FROMCOLOR])
```

(LENSE

```
  [LAMBDA (PTLST DS DENSITY PERCENT OUTTOOFLG)                    (* kbr: " 5-Jun-86 23:52")
                                                                  (* maps a list of points onto itself repeatedly until closure)
    (PROG (CENTERX CENTERY X Y OTHERPTS MAXCOLOR ENDCOLOR)
          (SETQ CENTERX (IQUOTIENT (for PT in PTLST sum (fetch (POSITION XCOORD) of PT))
                                   (LENGTH PTLST)))
          (SETQ CENTERY (IQUOTIENT (for PT in PTLST sum (fetch (POSITION YCOORD) of PT))
                                   (LENGTH PTLST)))
          [SETQ MAXCOLOR (MAXIMUMCOLOR (BITSPERPIXEL (COLORSCREENBITMAP]
          (DSPFILL NIL NIL NIL DS)                                (* make another polygon that is 80%% of the way to the edge.)
          [SETQ OTHERPTS (for PT in PTLST collect (create POSITION
                                                          XCOORD _ [COND
                                                                     ((IGREATERP (SETQ X (fetch (POSITION XCOORD)
                                                                                                of PT))
                                                                                 CENTERX)
                                                                      (IPLUS CENTERX (IQUOTIENT (ITIMES
                                                                                                  PERCENT
                                                                                                  (IDIFFERENCE X
                                                                                                         CENTERX))
```

```
                                                                    100)))
                                                        (T (IDIFFERENCE CENTERX
                                                                  (IQUOTIENT (ITIMES PERCENT
                                                                                     (IDIFFERENCE
                                                                                            CENTERX X))
                                                                             100]
                                                    YCOORD _ (COND
                                                                ((IGREATERP (SETQ Y (fetch (POSITION YCOORD)
                                                                                           of PT))
                                                                            CENTERY)
                                                                 (IPLUS CENTERY (IQUOTIENT (ITIMES
                                                                                           PERCENT
                                                                                           (IDIFFERENCE Y
                                                                                                  CENTERY))
                                                                                    100)))
                                                                (T (IDIFFERENCE CENTERY
                                                                          (IQUOTIENT (ITIMES PERCENT
                                                                                     (IDIFFERENCE
                                                                                            CENTERY Y))
                                                                                    100]
                                                    (* make sure the number of steps is integral to number of colors.)
                                                    (* draw from the outer one into the inner one, shifted by one)
    (SETQ ENDCOLOR (DRAWCOLORPOLYSTEPS PTLST (CONS (CAR (LAST OTHERPTS))
                                                   (BUTLAST OTHERPTS))
                           (ITIMES (OR DENSITY 3)
                                  15)
                           T 1 MAXCOLOR DS))                (* draw from the inner polygon to the outer one shifted by two
                                                            sides)
    (AND OUTTOOFLG (DRAWCOLORPOLYSTEPS (APPEND (CDR OTHERPTS)
                                               (LIST (CAR OTHERPTS)))
                           PTLST
                           (ITIMES (OR DENSITY 3)
                                  15)
                           T ENDCOLOR MAXCOLOR DS])
```

(LINETEST

```
  [LAMBDA (DS)
    [for Y from 100 to 400 by 300 do (for I from 100 to 400 by 20
                                        do (DRAWLINE 250 250 I Y 1 NIL DS (RAND 1 15]
    (for X from 100 to 400 by 300 do (for I from 100 to 400 by 20
                                        do (DRAWLINE 250 250 X I 1 NIL DS (RAND 1 15])
```

(MAPIT

```
  [LAMBDA (PTLST DS DENSITY)                                (* kbr: " 5-Jun-86 23:52")
                                                            (* maps a list of points onto itself)
    (DSPFILL NIL NIL NIL DS)
    (DRAWCOLORPOLYSTEPS PTLST [SETQ PTLST (APPEND (CDR PTLST)
                                                  (CONS (CAR PTLST]
           (ITIMES (OR DENSITY 3)
                  15)
           T 1 (MAXIMUMCOLOR (BITSPERPIXEL (COLORSCREENBITMAP)))
           DS])
```

(MAPIT2

```
  [LAMBDA (N DS DENSITY)                                    (* kbr: " 5-Jun-86 23:53")
                                                            (* create a random list of N points and maps it onto N others.)
    (PROG (ORGPOINTS NOWCOLOR MAXCOLOR)
          (SETQ ORGPOINTS (for I from 1 to N collect (RANDOMPT DS)))
          (SETQ NOWCOLOR 1)
          [SETQ MAXCOLOR (MAXIMUMCOLOR (BITSPERPIXEL (COLORSCREENBITMAP]
          (DSPFILL NIL NIL NIL DS)
          (SETQ STARTPTS ORGPOINTS)                         (* make sure the number of steps is integral to number of colors.)
          (for COUNTER from 1 to N do

          (* make the first pt of the new set the same as the last pt of the previous one.)

                                        [SETQ NEWPTS (COND
                                                     ((EQ COUNTER N)
                                                                (* for the past group, return to the starting points.)
                                                      ORGPOINTS)
                                                     (T (CONS (CAR (LAST STARTPTS))
                                                              (COND
                                                                 ((EQ COUNTER (SUB1 N))
                                                                 (* for next to last group make the last point the same as the
                                                                 start.)
                                                                  (NCONC1 (for I from 1
                                                                             to (IDIFFERENCE N 2)
                                                                             collect (RANDOMPT DS))
                                                                          (CAR ORGPOINTS)))
                                                                 (T (for I from 1 to (SUB1 N)
                                                                       collect (RANDOMPT DS]
                                        (SETQ NOWCOLOR (DRAWCOLORPOLYSTEPS STARTPTS NEWPTS
                                                              (ITIMES (OR DENSITY 3)
                                                                     15)
```

```
                                              NIL NOWCOLOR MAXCOLOR DS))
                               (SETQ STARTPTS NEWPTS])

(MOTIONIT
  [LAMBDA (WINDOW)                                          (* kbr: " 3-Sep-86 22:06")
    (PROG NIL
      LP  (SCREENCOLORMAP ONEMAP)
          (ONECOLORPOLY (RAND 3 4)
                 45 T 1 1 15 8 WINDOW)
          (DISMISS 2000)
          (SCREENCOLORMAP MOTIONMAP)
          (CD.QUITP 10)
          (until (CD.QUITP) do (ROTATECOLORMAP 1)
                               (DISMISS 75))
          (SCREENCOLORMAP PRETTYMAP)
          (CD.QUITP 20)
          (until (CD.QUITP) do (ROTATECOLORMAP 1)
                               (DISMISS 75))
          (SCREENCOLORMAP ONEMAP)
          (DISMISS 2000)
          (GO LP])

(ONECOLORPOLY
  [LAMBDA (NPOINTS NSTEPS CONNECTED? INCOLOR? FROMCOLOR TOCOLOR TWEENCOLOR DS)
                                                            (* rrb "11-OCT-82 11:41")

          (* draws a polygon figure on the display stream DS. INCOLOR? can be NIL for black and white case, a color number for the
          increment each polygons case, or a list of color numbers to be used for each edge of the polygons.)

    (COLORCONNECTPOLYS (for I from 1 to NPOINTS collect (RANDOMPT DS))
           (for I from 1 to NPOINTS collect (RANDOMPT DS))
           (OR NSTEPS POLYGONSTEPS)
           CONNECTED? INCOLOR? TOCOLOR FROMCOLOR TWEENCOLOR DS])

(RANDOMPT
  [LAMBDA (DS)                                              (* kbr: " 6-Jun-86 00:01")
    (PROG (REG)
          (SETQ REG (DSPCLIPPINGREGION NIL DS))
          (RETURN (create POSITION
                         XCOORD _ (RAND (fetch (REGION LEFT) of REG)
                                        (fetch (REGION RIGHT) of REG))
                         YCOORD _ (RAND (fetch (REGION BOTTOM) of REG)
                                        (fetch (REGION TOP) of REG])
)

(RPAQ? MOTIONMAP )

(RPAQ? ONEMAP )

(RPAQ? PRETTYMAP )

(RPAQQ MOTIONMAPCOLORS
       ((0 0 0)
        (0 0 0)
        (0 0 0)
        (0 0 0)
        (0 0 0)
        (0 0 0)
        (0 0 0)
        (0 0 79)
        (0 0 126)
        (0 0 168)
        (0 0 199)
        (0 0 255)
        (0 0 0)
        (0 0 0)
        (0 0 0)
        (0 0 0)))

(RPAQQ ONEMAPCOLORS
       ((100 100 100)
        (255 0 0)
        (255 0 0)
        (255 0 0)
        (255 0 0)
        (255 0 0)
        (255 0 0)
        (255 0 0)
        (255 0 0)
        (255 0 0)
        (255 0 0)
        (255 0 0)
        (255 0 0)
```

```
        (255 0 0)
        (255 0 0)
        (255 0 0)))

(RPAQQ PRETTYCOLORS
       ((0 0 0)
        (255 0 0)
        (255 206 0)
        (255 255 0)
        (128 255 0)
        (0 255 0)
        (0 255 128)
        (0 255 255)
        (0 128 255)
        (0 0 255)
        (128 0 255)
        (255 0 255)
        (255 128 255)
        (217 210 195)
        (160 172 180)
        (203 161 75)))

(PUTPROPS COLORPOLYGONS COPYRIGHT ("Xerox Corporation" 1986))
```

FUNCTION INDEX

BLACKHOLE 1
BLACKHOLE1 2
COLORCONNECTPOLYS 2
COLORDRAWPOLY1 2
COLORPOLYGON 1
COLORPOLYGONS 1
COLORPOLYGONS.ROTATECOLORMAP 1
DRAWCOLORPOLYSTEPS 3
LENSE 3
LINETEST 4
MAPIT 4
MAPIT2 4
MOTIONIT 5
ONECOLORPOLY 5
RANDOMPT 5

VARIABLE INDEX

MOTIONMAP 5
MOTIONMAPCOLORS 5
ONEMAP 5
ONEMAPCOLORS 5
PRETTYCOLORS 6
PRETTYMAP 5