Tutorial 52: CPL Buffers and cw/ccw Orientation

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Complete List of all Tutorials with Publishable MATLAB Files of this Solid-Geoemtries Toolbox

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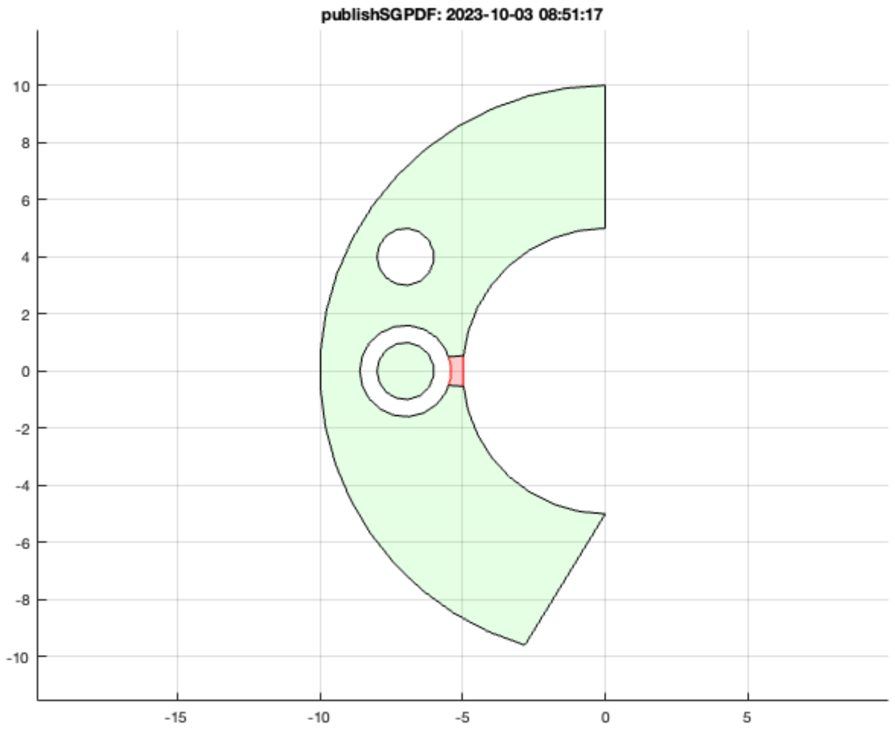
Motivation for this tutorial: (Originally SolidGeometry 4.8 required)

```
%In connection with the development of skeleton functions, there is always a need for CPL buffer functions.
%
% function VLFL_EXP52
```

We are looking for the regions of a CPL that have a wall distance smaller than 0.7 mm. These regions may not be 3D printable

```
CPLfindsmalldist(CPLsample(29),.7)
```

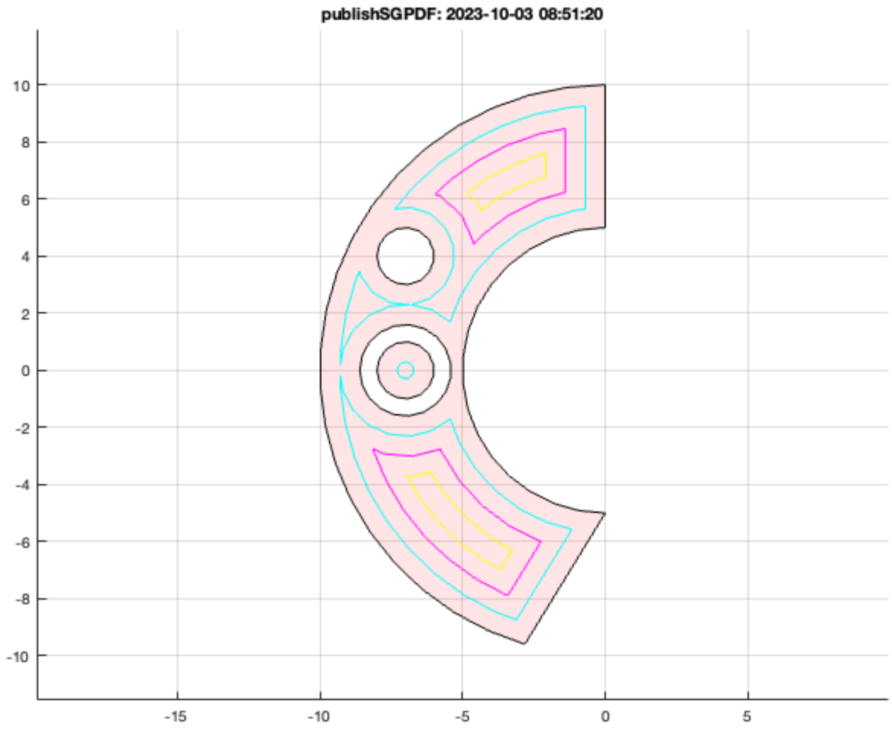
```
ans =
   -4.9787   -0.4613
   -4.9645   -0.5374
   -5.5024   -0.4981
   -5.4218   -0.2634
   -5.4218    0.2634
   -5.5024    0.4981
   -4.9645    0.5374
   -4.9787    0.4613
```



Sometimes you search for all lines in a defined distance to a Contour edge in a fixed distance grid

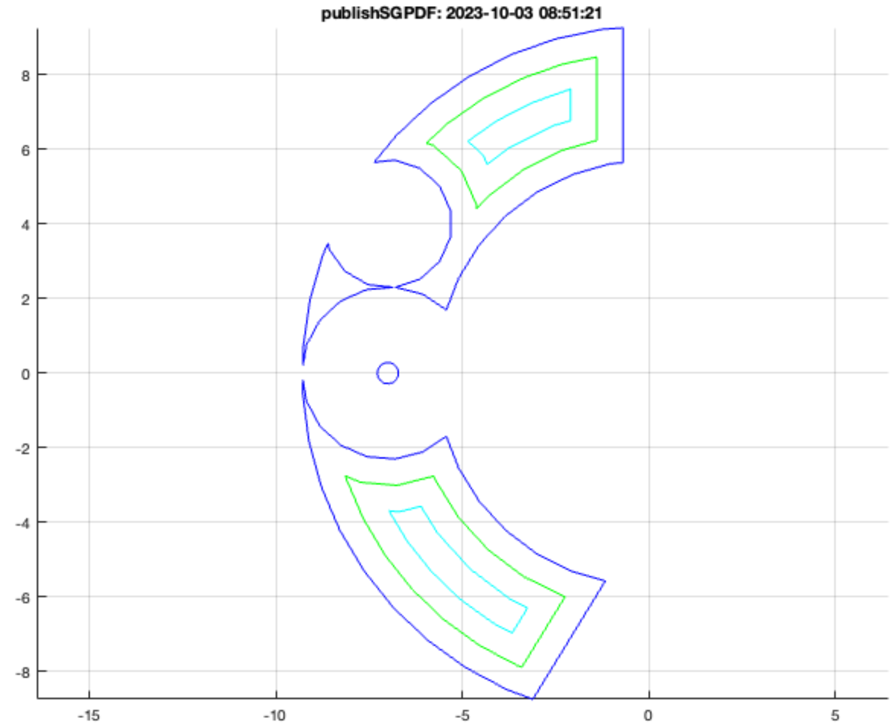
```
CPLbufferlines(CPLsample(29),.7)
```

```
ans =
  4×2 cell array
    {[      0]}    {92×2 double}
    {[0.7000]}    {82×2 double}
    {[1.4000]}    {34×2 double}
    {[2.1000]}    {23×2 double}
```



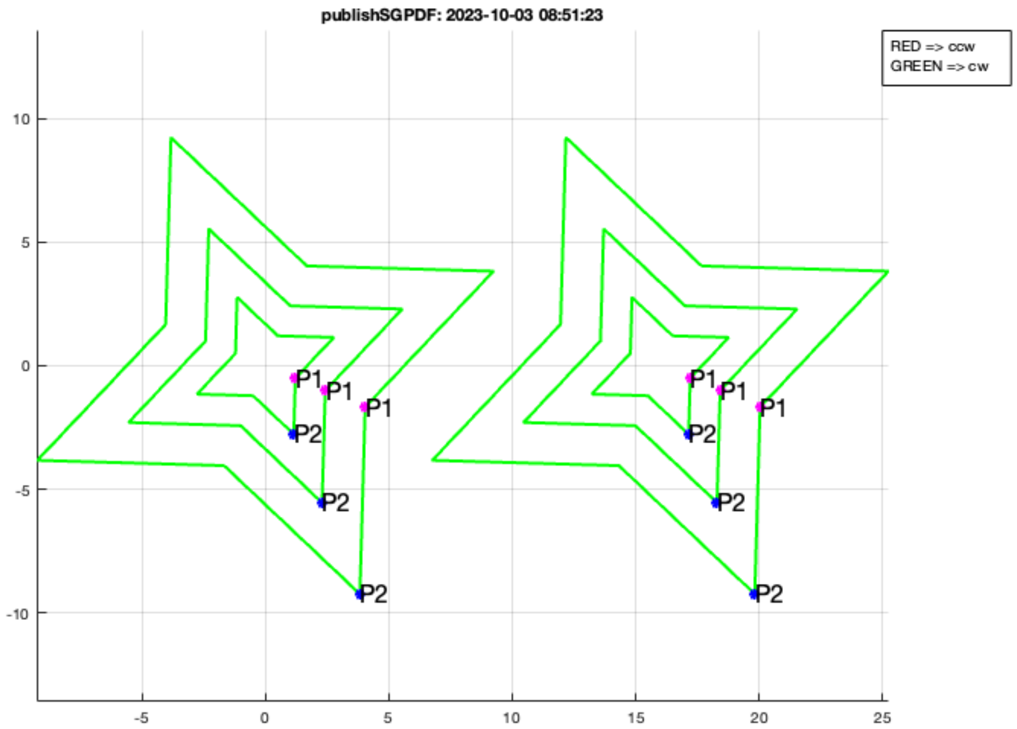
Sometimes you just want to get them plotted

```
SGfigure;CPLplotbufferlines(CPLsample(29),.7);
```



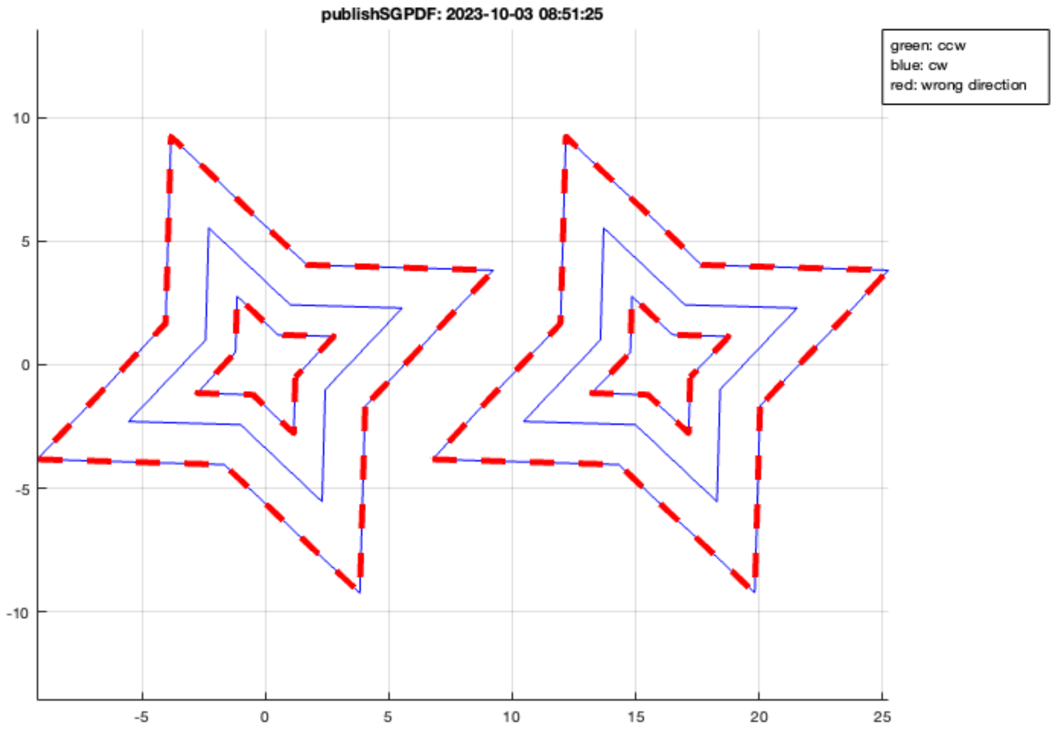
There is a function that intentionally changes the direction of rotation of all Contours is set to Clockwise.

```
CPLsetallcw(CPLsample(14));
```



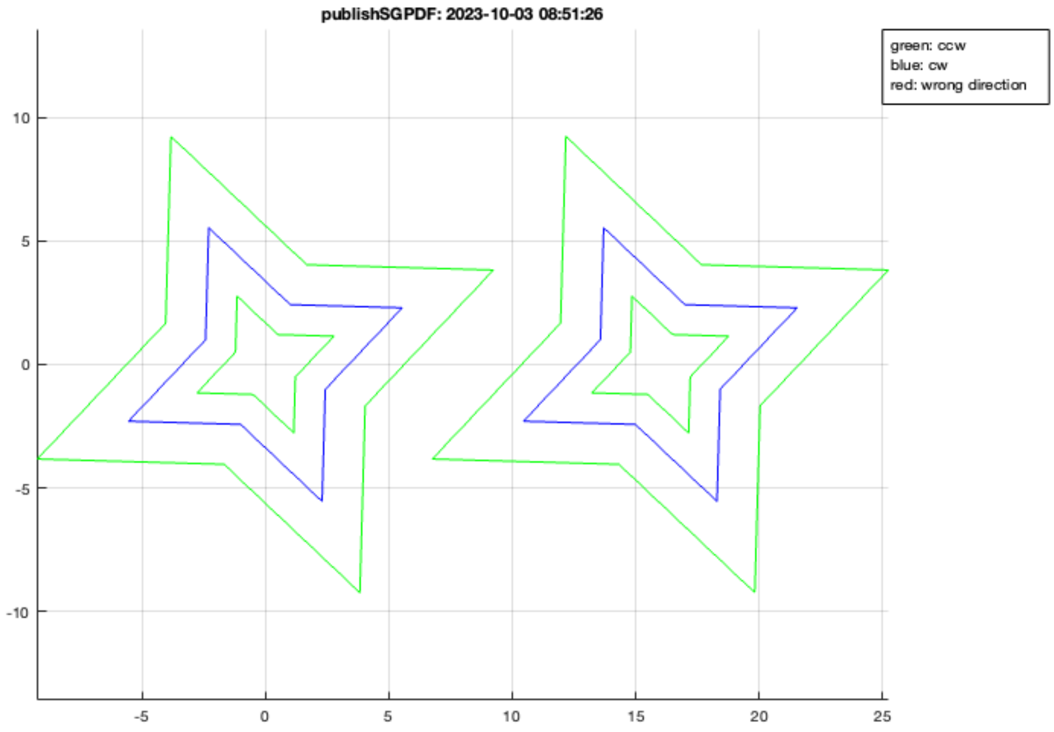
There is a function that indicates whether a CPL in the direction of rotation is correct as in the SG-lib. ccw is outside; cw is inside

```
CPLisccwinout(CPLsetallcw(CPLsample(14)));
```



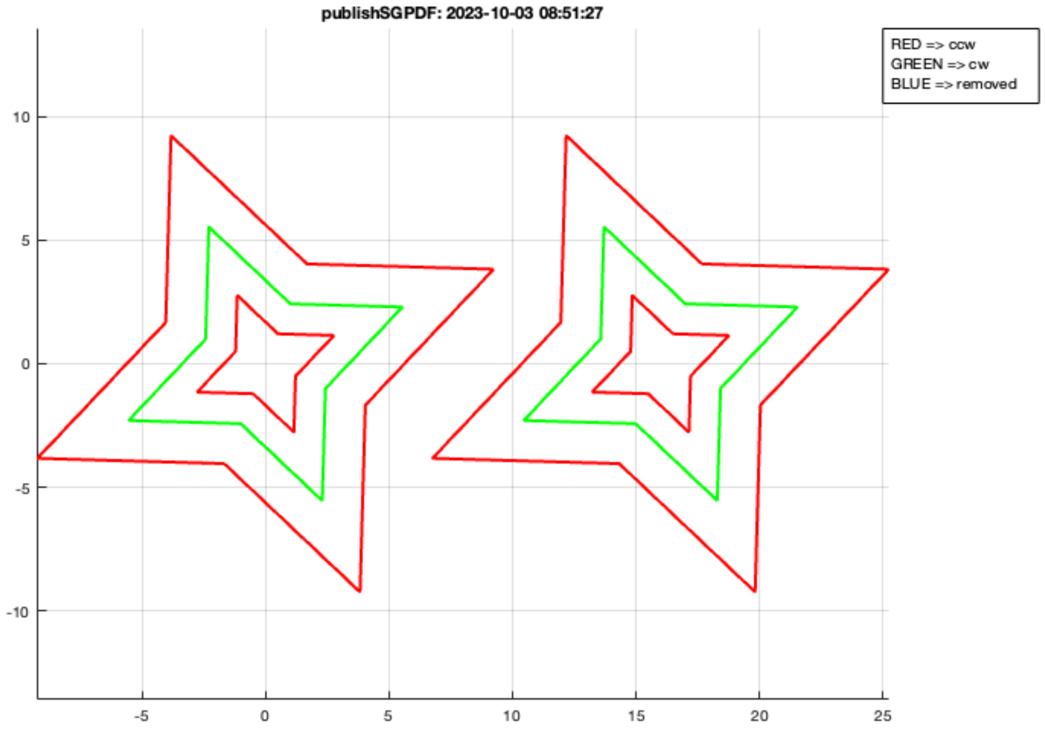
There is a function for correcting the direction of rotation of contours depending on the nesting depth within the contours

```
CPLisccwcorrected(CPLsetallcw(CPLsample(14)));
```



In the meantime there is a faster function based on the Polyshapes

```
CPLisccwcorrectedCPS(CPLsetallcw(CPLsample(14)));
```



Final Remarks

```
close all
VLFLlicense
```

```
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Please contact Tim Lueth, Professor at TU Munich, Germany!
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database_toolbox
distrib_computing_toolbox
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=====================================================================================================
```

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