Tutorial 36: Creating a Patient-Individual Arm-Skin Protector-Shell

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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 4.0 required)

I'd like to thank Gweni-Viani Alonso-Aruffo for her student internship in Spring 2017 in my lab at TU of Munich. She recorded the surface data and wrote Matlab fnctns for also creating SVG data for laser cutting of cloth to protect the skin from getting direct in contact to the 3D printed polymers.

```
% function VLFL_EXP36
```

1. Loading Surface Data

2. Interactive Selection of the Area

```
load AAruffo_surf.mat  % use loadweb('AAruffo_surf.mat'); the first time

SGfigure(SG1); view(19,15); camlight;
beep; pause;
ginput(1); p1=select3d
ginput(1); p2=select3d
T=T2P(p1,p2-p1)
Ti=eye(4)/T
pn=VLtransT(p2',Ti); z=pn(3)

SGX=SGtransT(SG1,Ti); SGfigure(SGX); view(0,0)
```

```
p1 =
  -23.5437
  581.8615
   64.5263
p2 =
   -4.7223
  568.4742
  -58.4266
T =
    0.9886         0    0.1504  -23.5437
    0.0163   -0.9941   -0.1070  581.8615
    0.1496    0.1082   -0.9828   64.5263
         0         0         0    1.0000
Ti =
    0.9886    0.0163    0.1496    4.1497
         0   -0.9941    0.1082  571.4584
    0.1504   -0.1070   -0.9828  129.2237
         0         0         0    1.0000
z =
  125.1035
```

```
load AAruffo_surf.mat  % use loadweb('AAruffo_surf.mat'); the first time

SGfigure(SG1); view(19,15); camlight;
```
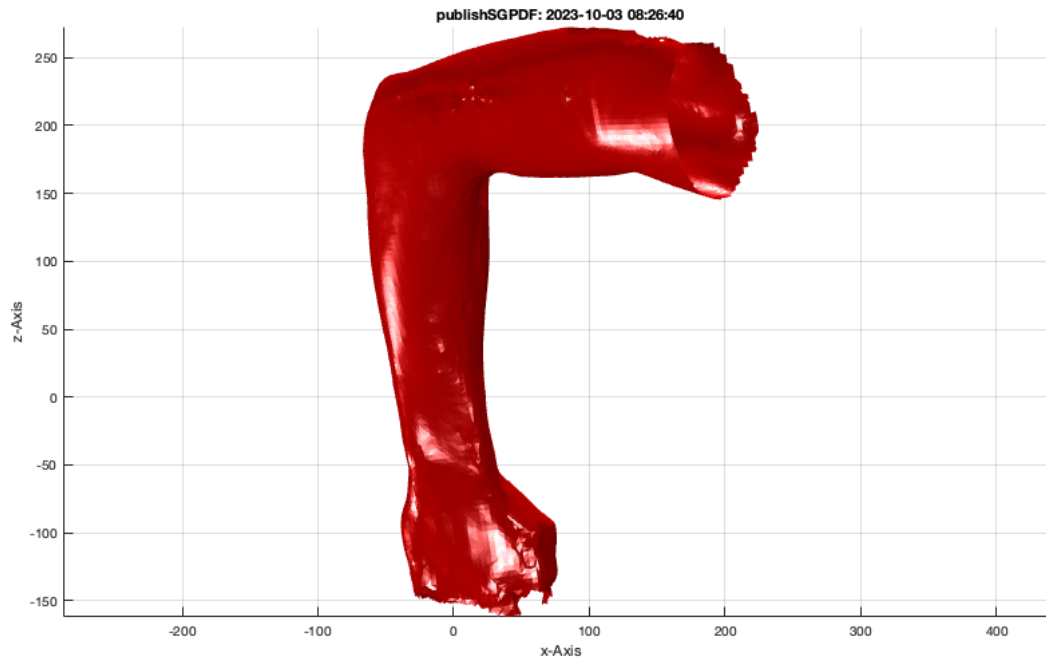
Cut the selected arm area

```
pn=VLtransT(p2',Ti); z=pn(3)
SGcut(SGX,[0 z]);
[SGout,SGin]=SGcut(SGX,[0 z]);
```

```
z =
  125.1035
ans =
  Figure (1: AOI Matlab Solid Modeler app_2012_11_09) with properties:

      Number: 1
        Name: 'AOI Matlab Solid Modeler app_2012_11_09'
       Color: [1 1 0.9000]
    Position: [1 833 960 540]
       Units: 'pixels'

  Use GET to show all properties
```
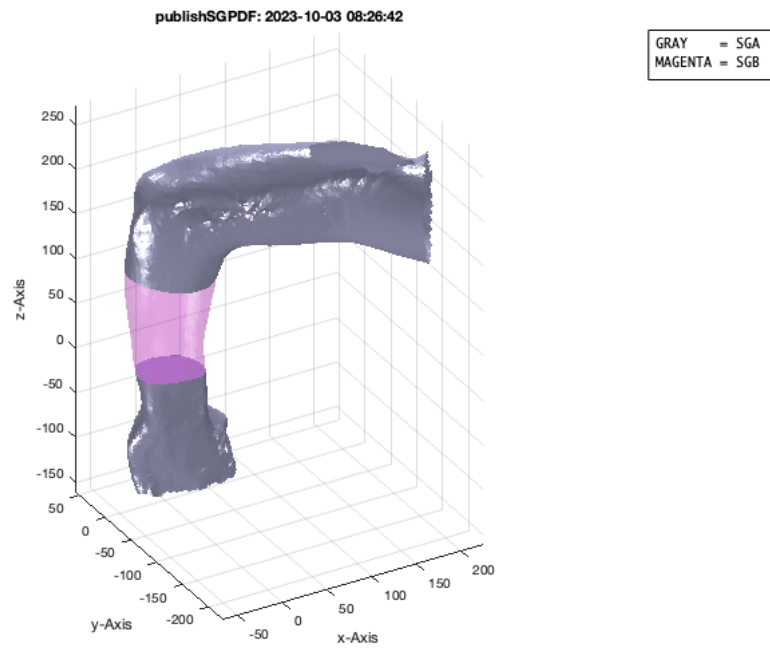
Show only the selected

```
SGfigure(SGin); view(-30,30); VLFLplotlight(1,1);
```