

[ // PANELIZATION STUDIES, Maysam Ghaffari  
// Coding Form,Satoru Sugihara  
// Sci-Arc Fall2011 ]

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import processing.opengl.*;
import igeo.geo.*;
import igeo.core.*;
import igeo.util.*;

size(800, 800, IGL.GL);
smooth();

//input geometry from 3dm file
IG.open("midterm.3dm");
ISurface[] surfs = IG.surfaces();

// Layers in rhino
ILayer layer1 = IG.layer("structure");
ILayer layer2 = IG.layer("infill");
ILayer layer3 = IG.layer("frame");

//input jpg map files
IImageMap map = new IImageMap("map1.jpg");
IImageMap map2 = new IImageMap("map5.jpg");

// surface subdivision
for (ISurface surf : surfs) {
    int hDiv = 15, vnum = 30;
    double vDiv = 1.0/hDiv, vinc = 1.0/vnum;

    IVec[][] endPoints = new IVec[30][60];

    for (int i=0; i < hDiv; i++) {
        for (int j = 0; j < vnum; j++) {
            IVec pt11 = surf.pt(i*vDiv, j*vinc);
            IVec pt21 = surf.pt((i+1)*vDiv, j*vinc);
            IVec pt12 = surf.pt(i*vDiv, (j+1)*vinc);
            IVec pt22 = surf.pt((i+1)*vDiv, (j+1)*vinc);
            ISurface panel = new ISurface(pt11, pt21, pt22, pt12).clr(map2.clr(i*vDiv, j*vinc)).layer(layer2);

            //Frame Extrusion
            int crvDegree = 1;
            ICurve crv = new ICurve(new IVec[] {pt11, pt21, pt22, pt12}, crvDegree, true);
            IG.extrude(crv, -1).clr(255, 50).layer(layer3);

            // diagrid structure
            IVec spt1 = surf.pt(i*vDiv, j*vinc, -10);
            IVec spt2 = surf.pt((i+1)*vDiv, (j-1)*vinc, -10);
            IVec spt3 = surf.pt((i-1)*vDiv, (j+1)*vinc, -10);
            new ICylinder(spt1, spt2, 0.2).clr(map2.clr(i*vDiv, j*vinc)).layer(layer1);
            new ICylinder(spt1, spt3, 0.2).clr(map2.clr(i*vDiv, j*vinc)).layer(layer1);

            //Infill Scale
            double val = map.get(i*vDiv, j*vinc);
            IVec center = surf.pt((i+0.5)*vDiv, (j+0.5)*vinc);
            panel.scale(center, 1 - val);

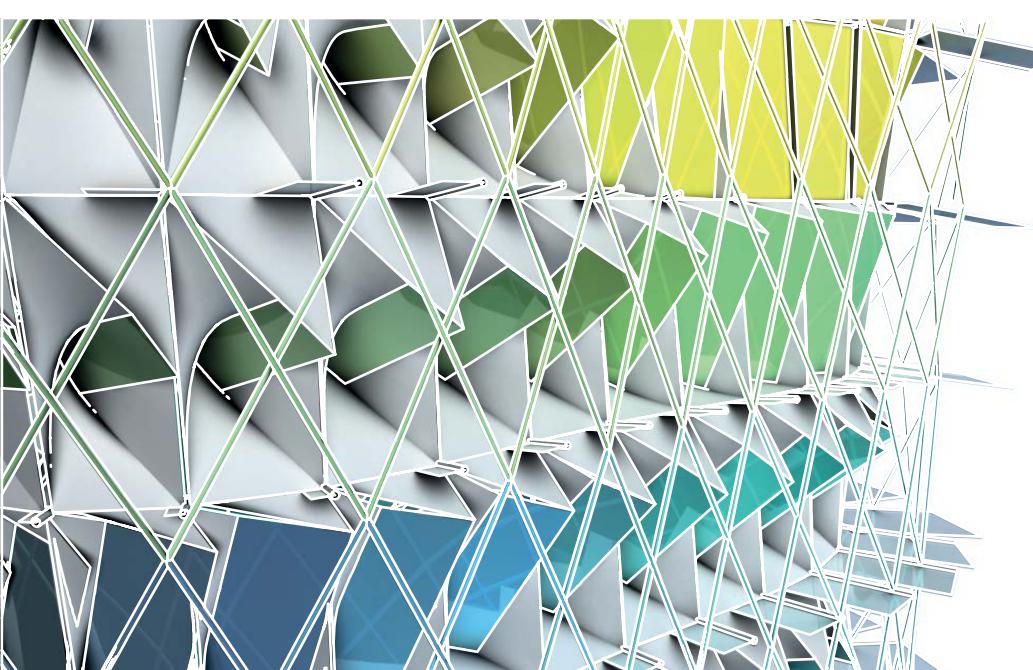
            //Infill Rotation
            IVec normal = surf.nml((i+45)*vDiv, (j+0.5)*vinc);
            panel.rot(center, normal, val*PI/1);

            // Structure vertical connection and shading device
            IVec pt1 = surf.pt(i*vDiv, j*vinc);
            IVec pt2 = surf.pt(i*vDiv, j*vinc, val*-20);
            ICurve crv1 = new ICurve(pt1, pt2).clr(map2.clr(i*vDiv, j*vinc));
            ICurve crv2 = new ICurve(pt1, pt2).clr(map2.clr(i*vDiv, j*vinc));
            IG.loft(crv1, crv2);
            new ICylinder(pt1, pt2, 0.3).clr(5);

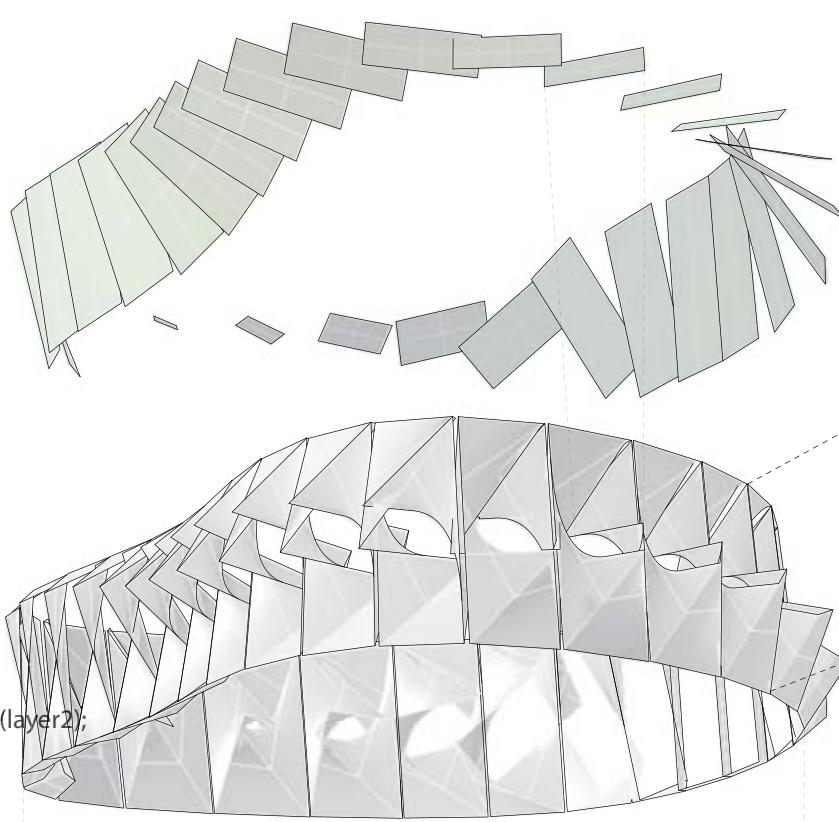
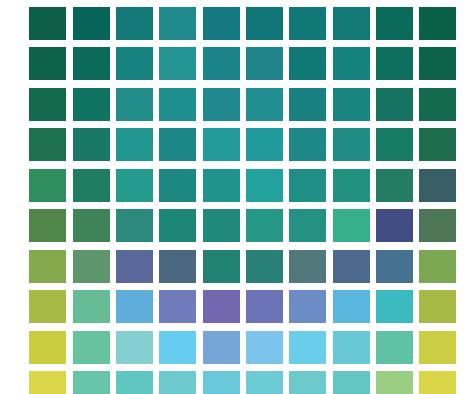
        }
    }
    surf.del();
}

//save in rhino
IG.save("test_output_file.3dm");

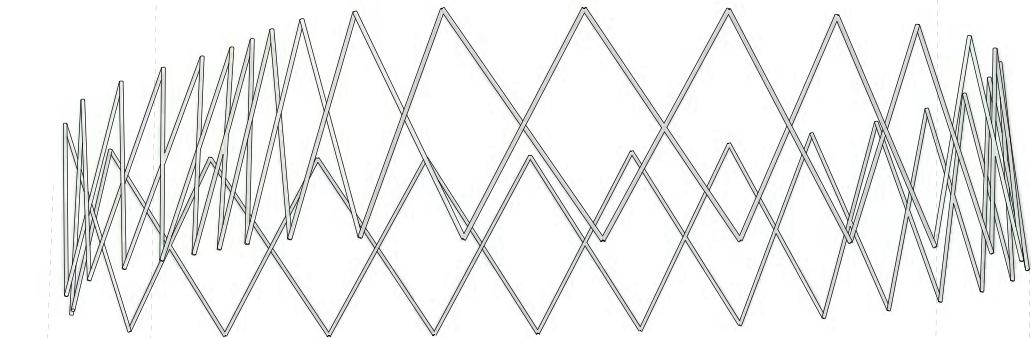
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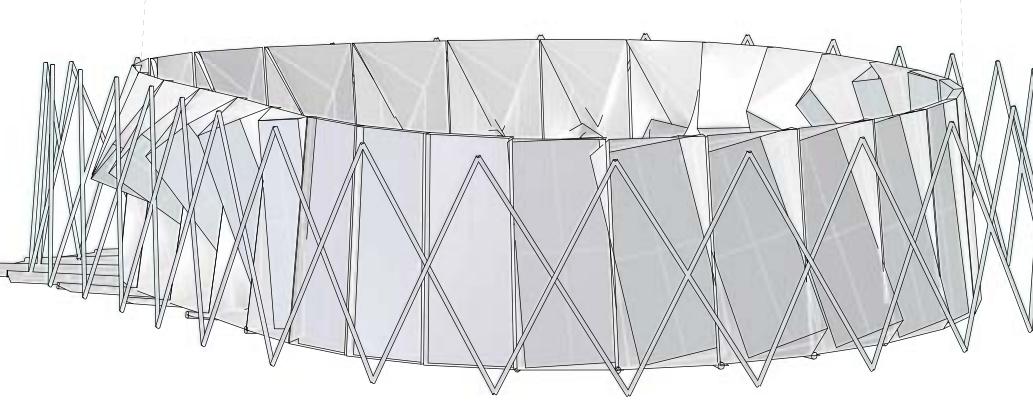
SKIN COLOR PATTERN



SCALE PATTERN



X ROTATION PATTERN



Y ROTATION PATTERN

