开发环境:

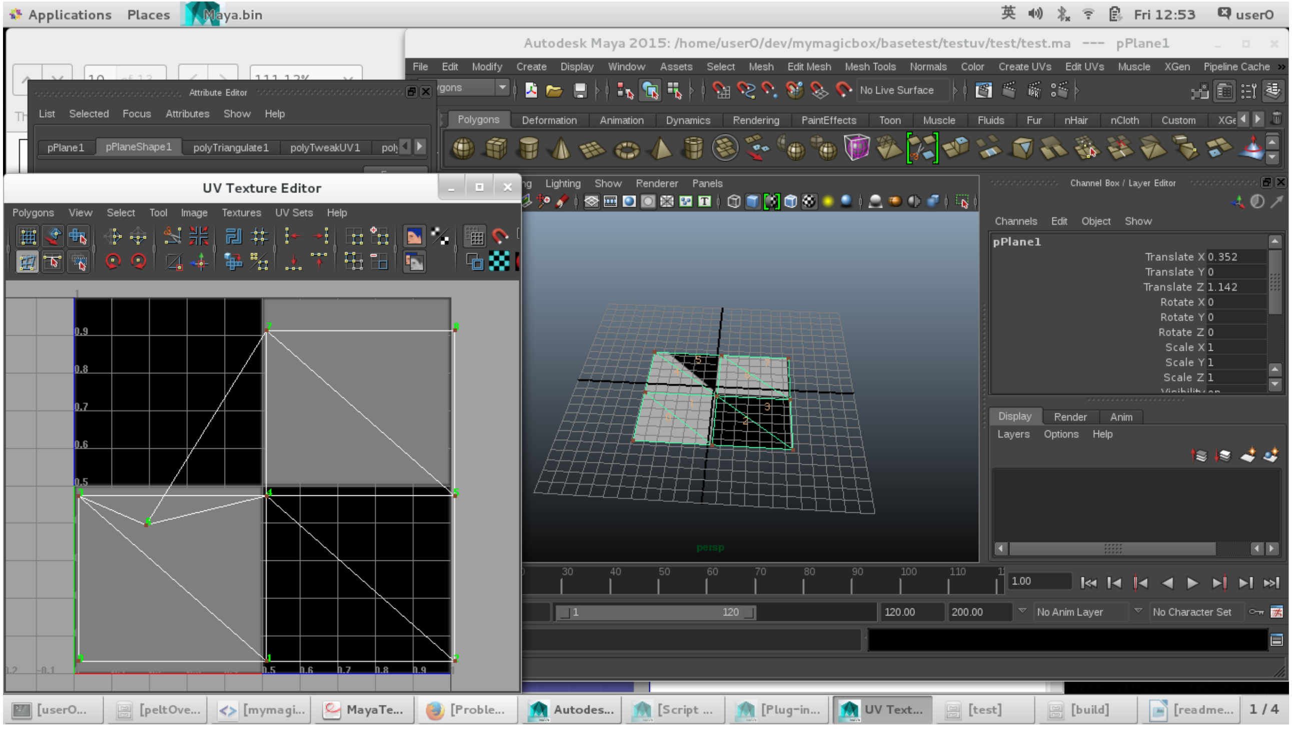
CentOS7 x64, maya2015x64, CMake, CodeBlocks

命令算法说明:

```
void peltOverlap::numOverlapUVFaces(const MString& shadingGroup, MStringArray& flattenFaces)
{
    MFloatArray  face1Orig, face1Vec, face2Orig, face2Vec, center, radius;

    // Loop through face i
    unsigned int numOverlap = 0;
    createBoundingCircle(flattenFaces, center, radius);

    for(unsigned int i = 0; i < flattenFaces.length() && numOverlap < fNthPairs; i++)
    {
        // for face[i]
        //construct point and edge(line section) for face[i]
        if(!createRayGivenFace(flattenFaces[i], face1Orig, face1Vec))
            continue;

        // center point of face[i]
        const float cui  = center[2*i];
        const float cvi  = center[2*i+1];

        //radius of face[i]
        const float ri  = radius[i];


        //test face[i] and other faces
        for(unsigned int j = i+1; j < flattenFaces.length() && numOverlap < fNthPairs; j++)
        {
            // center point of face[j]
            const float &cuj = center[2*j];
            const float &cvj = center[2*j+1];

            //radius of face[j]
            const float &rj  = radius[j];

            // Quick rejection if bounding circles don't overlap
            // 如果两个线段的中心点的距离大于它们的外接圆的半径和, 则这两个线段不可能相交
            float du = cuj - cui;
            float dv = cvj - cvi;
            float dsqr = du*du + dv*dv;
            if (dsqr >= (ri+rj)*(ri+rj))
                continue;

            //construct point and edge(line section) for face[j]
            if(!createRayGivenFace(flattenFaces[j], face2Orig, face2Vec))
    continue;

            // test if the two line sections cross with each other
            if (checkCrossingEdges(face1Orig, face1Vec, face2Orig, face2Vec)) {
                numOverlap++;
                appendToResult(flattenFaces[i]);
                appendToResult(flattenFaces[j]);
                continue;
            }
        }
    }
}
```

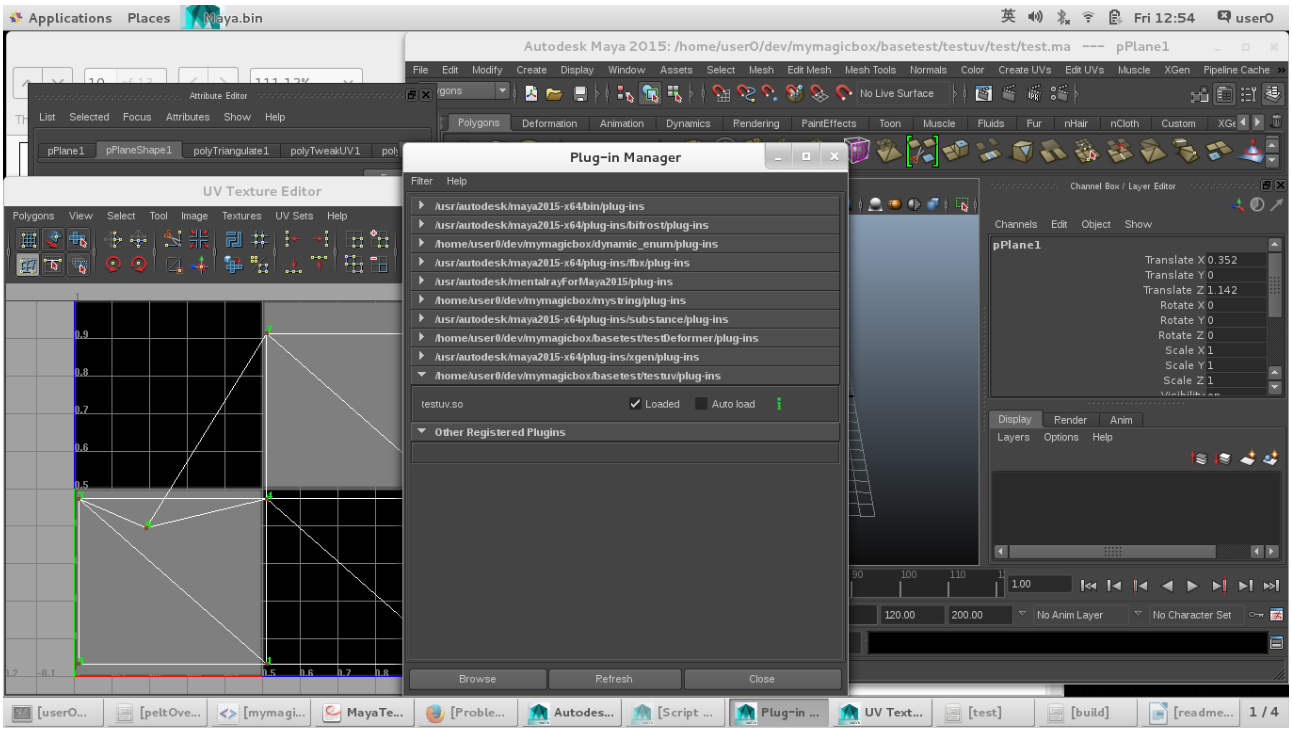
使用说明:

1. 打开场景(例如 testuv/test/test.ma),



pPlane1
Translate X 0.352
Translate Y 0
Translate Z 1.142
Rotate X 0
Rotate Y 0
Rotate Z 0
Scale X 1
Scale Y 1
Scale Z 1

2. 加载插件 testuv.so



Autodesk Maya 2015: /home/user0/dev/mymagicbox/basetest/testuv/test/test.ma --- pPlane1

Plug-in Manager

/usr/autodesk/maya2015-x64/bin/plug-ins
/usr/autodesk/maya2015-x64/plug-ins/bifrost/plug-ins
/home/user0/dev/mymagicbox/dynamic_enum/plug-ins
/usr/autodesk/maya2015-x64/plug-ins/fbx/plug-ins
/usr/autodesk/mentalrayForMaya2015/plug-ins
/home/user0/dev/mymagicbox/mystring/plug-ins
/usr/autodesk/maya2015-x64/plug-ins/substance/plug-ins
/home/user0/dev/mymagicbox/basetest/testDeformer/plug-ins
/usr/autodesk/maya2015-x64/plug-ins/xgen/plug-ins
/home/user0/dev/mymagicbox/basetest/testuv/plug-ins

testuv.so ☑ Loaded □ Auto load

Other Registered Plugins

pPlane1
Translate X 0.352
Translate Y 0
Translate Z 1.142
Rotate X 0
Rotate Y 0
Rotate Z 0
Scale X 1
Scale Y 1
Scale Z 1

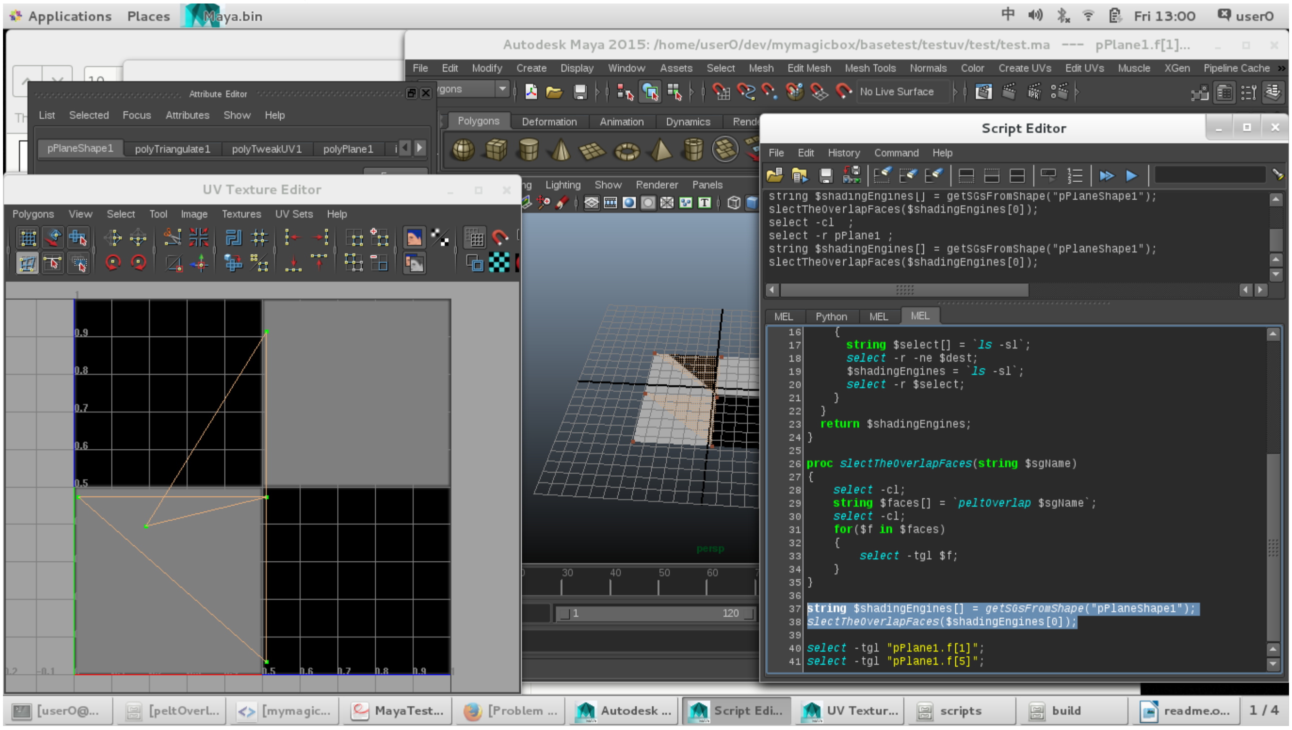
3. source 下面的 mel 函数(这些函数可以在 testuv/scripts/utility.mel 里找到)

```
proc string[] getSGsFromShape( string $shape )
{
  string $shadingEngines[];
  if ( `objExists $shape` )
  {
    string $dest[] = `listConnections -destination true -source false
      -plugs false -type "shadingEngine" $shape`;

    // listConnections can return duplicates within its list.
    // The select below is a quick trick to avoid dupes in the
    // returned array.
    if ( size( $dest ) )
    {
      string $select[] = `ls -sl`;
      select -r -ne $dest;
      $shadingEngines = `ls -sl`;
      select -r $select;
    }
  }
  return $shadingEngines;
}

proc slectTheOverlapFaces(string $sgName)
{
    select -cl;
    string $faces[] = `peltOverlap $sgName`;
    select -cl;
    for($f in $faces)
    {
        select -tgl $f;
    }
}
//Example:
//string $shadingEngines[] = getSGsFromShape("pPlaneShape1");
//slectTheOverlapFaces($shadingEngines[0]);
```

4. 输入参数是 mesh 名(比如"pPlaneShape1"):

```
string $shadingEngines[] = getSGsFromShape("pPlaneShape1");
slectTheOverlapFaces($shadingEngines[0]);
```

5. 结果是如果 uv 有穿插, 那些面片就会被选择



```
string $shadingEngines[] = getSGsFromShape("pPlaneShape1");
slectTheOverlapFaces($shadingEngines[0]);
select -cl  ;
select -r pPlane1 ;
string $shadingEngines[] = getSGsFromShape("pPlaneShape1");
slectTheOverlapFaces($shadingEngines[0]);
```

```
        {
            string $select[] = `ls -sl`;
            select -r -ne $dest;
            $shadingEngines = `ls -sl`;
            select -r $select;
        }
    }
    return $shadingEngines;
}

proc slectTheOverlapFaces(string $sgName)
{
    select -cl;
    string $faces[] = `peltOverlap $sgName`;
    select -cl;
    for($f in $faces)
    {
        select -tgl $f;
    }
}

string $shadingEngines[] = getSGsFromShape("pPlaneShape1");
slectTheOverlapFaces($shadingEngines[0]);

select -tgl "pPlane1.f[1]";
select -tgl "pPlane1.f[5]";
```