Win3D Game engine

1. SDKMesh, 使用右手坐标系时,需要对模型做(1,1,-1) scale即Z轴取反，同时指定光栅化阶段顺时针剪裁
2. 2015.11.03, 方向光设置错误，地面阴影计算将被优化掉，无法在图形分析工具中看见PS state.
3. 2016.3.10

If the object cannot be rendered in viewport, perform the following steps

1. Check World, View and Project matrix, adjust distance of camera to object
2. Check Bounding Volume
3. Check animation time
4. Check skin data
5. Check bone matrix array

G-BUFFER

**Option 1**:

32bit color depth, requires position reconstruction from depth and normal Z reconstruction from normal X,Y, but is smaller  
RT1: 24 depth; 8 material index (is there a texture format that I can use like this?)  
RT2: 16 normX; 16 normY  
RT3: 8 red; 8 green; 8 blue; 7 specular exponent, 1 emisseve (packed)

1. Renderring CMO model with Left coordinate 2016.4.28
2. Call function CreateFromCMO with default parameter ccw = false
3. Set Z is opposite by scale (1, 1, -1)
4. Draw with left coordinate

CMO file format

# Overview of the CMO file format

The CMO file is compiled from FBX file, Obj or Dalla by Visual Studio 2005

# Add shadow for an effect

1. Modify fx file as follow

#include "ShadowMap.fx"

//--------------------------------------------------------------------------------------

// Vertex Shader : Skinned shadow map

//--------------------------------------------------------------------------------------

V2P\_SHADOW\_MAP VSBasicShadowMap(VSInputNmTx Input)

{

float4 pos = mul(Input.Position, WorldViewProj);

return VSShadowMap(pos);

}

PS shader

{

// Only the first light casts a shadow.

float3 shadow = float3(1.0f, 1.0f, 1.0f);

shadow[0] = CalcShadowFactor(SamPointClamp, ShadowMapTex, pixel.tangent);

diffuseSum = shadow[i] \* lambert;

specularSum = shadow[i] \* specular;

}

1. Inherit interface IEffectShadow

7.2016-06-21, Fix the problem of m\_swapChain->ResizeBuffers function failure

m\_swapChain->ResizeBuffers return 0x887a0001,

Error detail:

You can't resize a swap chain unless you release all outstanding references to its back buffers. You must release all of its direct and indirect references on the back buffers in order for **ResizeBuffers** to succeed

Reason : the references of swap chain don’t be released.

Solution:

In ShadowMapEffect.cpp

//

// Unbind Render traget and set it to PS shader resource

//

void ShadowMap::UnbindRenderTarget(ID3D11DeviceContext \* deviceContext)

{

ID3D11RenderTargetView\* renderTargets[1] = { m\_originalRTV };

deviceContext->RSSetViewports(1, &m\_originalViewport);

deviceContext->OMSetRenderTargets(1, renderTargets, m\_pOriginalDSV);

//ID3D11ShaderResourceView \*const pSRV[1] = { m\_shadowMapSRV.Get() };

//deviceContext->PSSetShaderResources(1, 1, pSRV);

m\_originalRTV->Release();

m\_pOriginalDSV->Release();

}

Retrieve device type:

DXGI\_FORMAT format;

AnalyticsVersionInfo^ analyticsVersion = AnalyticsInfo::VersionInfo;

if(analyticsVersion->DeviceFamily == L"Windows.Mobile")

{ . . . }

# FBXtoSDMMesh

1.导出，绑定位置计算

bool ParseMeshSkinning( FbxMesh\* pMesh, SkinData\* pSkinData )

{

FbxMatrix matBindPose = matXBindPose.Inverse() \* matReferenceGlobalInitPosition;

}

2.导出，绑定矩阵不再乘父矩阵的逆矩阵， 27行

XMMATRIX ParseTransform( FbxNode\* pNode, ExportFrame\* pFrame, CXMMATRIX matParentWorld, const bool bWarnings = true )

{

XMMATRIX matWorld;

XMMATRIX matLocal;

bool bProcessDefaultTransform = true;

if( !g\_BindPoseMap.empty() )

{

const char \* name = pNode->GetName();

PoseMap::iterator iter = g\_BindPoseMap.find( pNode );

if( iter != g\_BindPoseMap.end() )

{

FbxMatrix PoseMatrix = iter->second;

matWorld = ConvertMatrix( PoseMatrix );

XMMATRIX matInvParentWorld = XMMatrixInverse( nullptr, matParentWorld );

matLocal = XMMatrixMultiply( matWorld, matInvParentWorld);

//bind pose matrix don't multiply the inverse matrix of parent's matirx

matLocal = matWorld;

bProcessDefaultTransform = false;

}

}

......

}

3.Sdkmesh绘制，不再乘父矩阵 47行

void Model::TransformBindPoseFrame(UINT iFrame, CXMMATRIX ParentWorld)

{

// Transform ourselves

XMMATRIX LocalWorld = XMLoadFloat4x4(&frames[iFrame]->Matrix);

#ifdef \_DEBUG

XMVECTOR scale, rot, trans;

XMMatrixDecompose(&scale, &rot, &trans, LocalWorld);

#endif

//LocalWorld \*= ParentWorld; //不再乘父矩阵

XMStoreFloat4x4(&frames[iFrame]->mBindPoseFrameMatrix, LocalWorld);

// Transform our siblings

if (frames[iFrame]->SiblingFrame != INVALID\_FRAME)

TransformBindPoseFrame(frames[iFrame]->SiblingFrame, ParentWorld);

// Transform our children

if (frames[iFrame]->ChildFrame != INVALID\_FRAME)

TransformBindPoseFrame(frames[iFrame]->ChildFrame, LocalWorld);

}

4. sdkmes绘制， 不再计算逆矩阵， 79行

void Model::TransformMesh(CXMMATRIX World, double fTime)

{

if (currentAnim == UINT(-1))

return;

auto & anim = animations[currentAnim];

if (FTT\_RELATIVE == anim->frameTransformType)

{

TransformFrame(0, World, fTime);

// For each frame, move the transform to the bind pose, then

// move it to the final position

for (UINT i = 0; i < frames.size(); i++)

{

XMMATRIX BindPosMat = XMLoadFloat4x4(&frames[i]->mBindPoseFrameMatrix);

XMMATRIX TransfromedPosMat = XMLoadFloat4x4(&frames[i]->mTransformedPoseFrameMatrix);

//XMMATRIX mFinal = XMMatrixInverse(NULL, BindPosMat) \* TransfromedPosMat; //不再计算逆矩阵

XMMATRIX mFinal = BindPosMat \* TransfromedPosMat;

XMStoreFloat4x4(&frames[i]->mTransformedPoseFrameMatrix, mFinal);

}

}

else if (FTT\_ABSOLUTE == anim->frameTransformType)

{

for (UINT i = 0; i < frames.size(); i++)

TransformFrameAbsolute(i, fTime);

}

}

03/17/2017

Get App current path

* Platform::String^ appInstallFolder = Windows::ApplicationModel::Package::Current->InstalledLocation->Path; //where program in installed. Have read only access
* Platform::String^ localfolder = Windows::Storage::ApplicationData::Current->LocalFolder->Path; //for local saving for future
* Platform::String^ roamingFolder = Windows::Storage::ApplicationData::Current->RoamingFolder->Path; //for sync between devices
* Platform::String^ temporaryFolder = Windows::Storage::ApplicationData::Current->TemporaryFolder->Path; //for temp saving. Cleared often by system

# 07/03/2017

## Finished works

1. Host Chakra JavaScript Engine
2. Render FBX animation
3. Create a virtual game controller
4. Animation Event
5. Support JavaScript Promise syntax