![A group of people holding wine glasses

Description automatically generated]()

Image Manipulation in a "Magic Lens"

Project 5

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# Images

![A picture containing person, tree, outdoor, woman

Description automatically generated]()

Figure 1: uScenter Adjusted

![A person holding a cup

Description automatically generated]()

Figure 2: uTcenter Adjusted

![A group of people standing next to a person

Description automatically generated]()

Figure 3: uRadius Adjusted

![A group of people standing next to a person

Description automatically generated]()

Figure 3: uMag Factor Adjusted

![A person standing in front of a cake

Description automatically generated]()

Figure 5: u uRotAngle Adjusted

![A couple of people standing next to a person

Description automatically generated]()

Figure 6: uSharpFactor Low Value

![A couple of people standing next to a person

Description automatically generated]()

Figure 6: uSharpFactor High Value

## Key Code

ivec2 ires = textureSize( uImageUnit, 0 );

float ResS = float( ires.s );

float ResT = float( ires.t );

//Look for fragment inside lense

vec2 lenST = vec2(uScenter,uTcenter);

if (sqrt(pow(uScenter - vST.s,2)+pow(uTcenter - vST.t,2)) <= uRadius){

//Magnify

vec2 magST = (lenST - vST)\*uMagFactor;

//Rotate

vec2 rotST = magST + lenST + vec2((vST.s - uScenter)\*cos(uRotAngle) - (vST.t -uTcenter)\*sin(uRotAngle),(vST.s -uScenter)\*sin(uRotAngle) + (vST.t -uTcenter)\*cos(uRotAngle));

//Sharpen

vec2 stp0 = vec2(1./ResS, 0. );

vec2 st0p = vec2(0. , 1./ResT);

vec2 stpp = vec2(1./ResS, 1./ResT);

vec2 stpm = vec2(1./ResS, -1./ResT);

vec3 i00 = texture2D( uImageUnit, rotST ).rgb;

vec3 im1m1 = texture2D( uImageUnit, rotST-stpp ).rgb;

vec3 ip1p1 = texture2D( uImageUnit, rotST+stpp ).rgb;

vec3 im1p1 = texture2D( uImageUnit, rotST-stpm ).rgb;

vec3 ip1m1 = texture2D( uImageUnit, rotST+stpm ).rgb;

vec3 im10 = texture2D( uImageUnit, rotST-stp0 ).rgb;

vec3 ip10 = texture2D( uImageUnit, rotST+stp0 ).rgb;

vec3 i0m1 = texture2D( uImageUnit, rotST-st0p ).rgb;

vec3 i0p1 = texture2D( uImageUnit, rotST+st0p ).rgb;

vec3 target = vec3(0.,0.,0.);

target += 1.\*(im1m1+ip1m1+ip1p1+im1p1);

target += 2.\*(im10+ip10+i0m1+i0p1);

target += 4.\*(i00);

target /= 16.;

gl\_FragColor = vec4( mix( target, texture(uImageUnit,rotST).rgb, uSharpFactor ), 1. );

}

else{

gl\_FragColor = texture(uImageUnit,vST);

}

## Video Link

## <https://media.oregonstate.edu/media/t/0_7opvq49y>

## Comments

Sorry for being a day late.