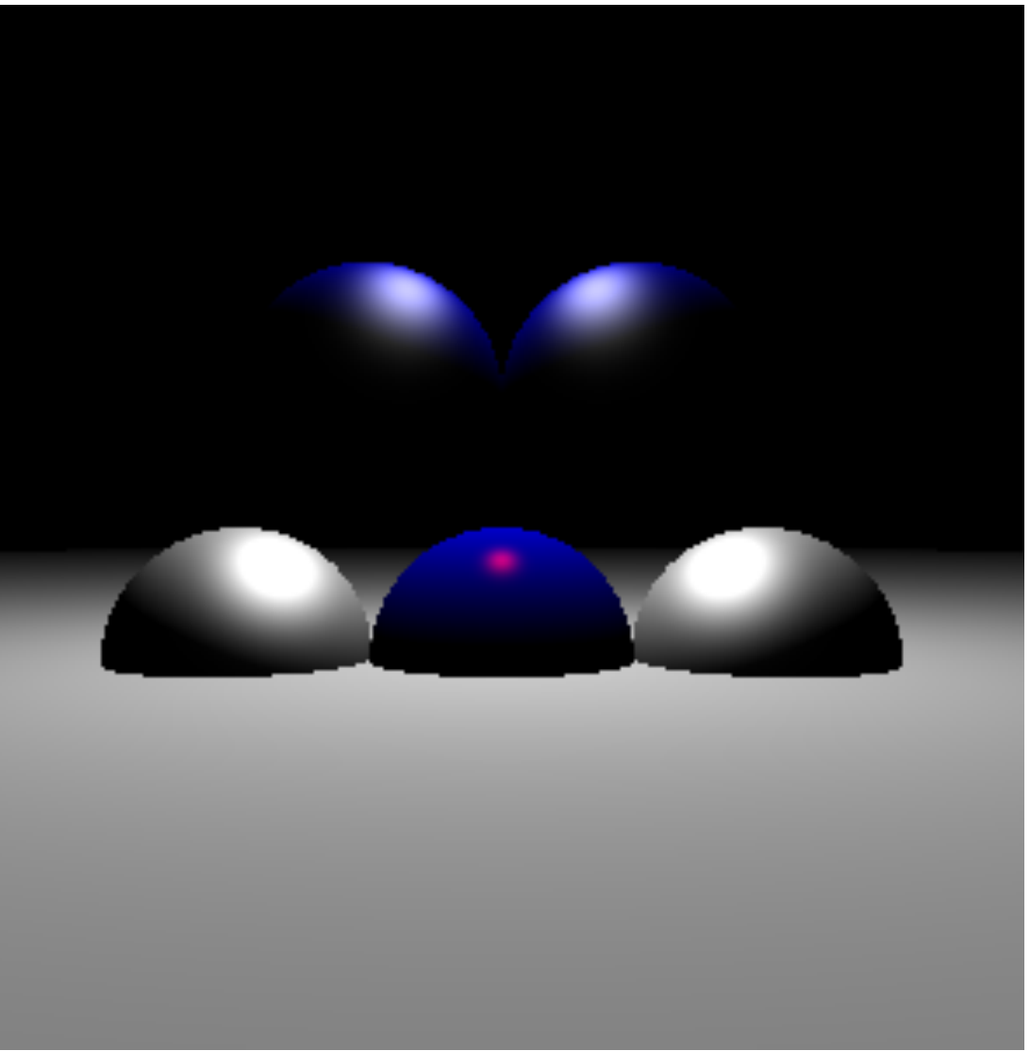
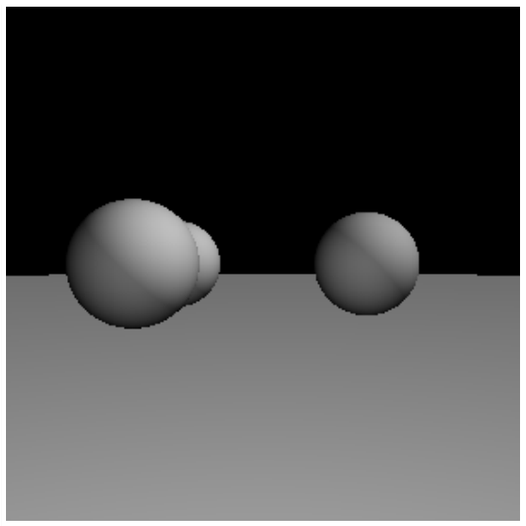
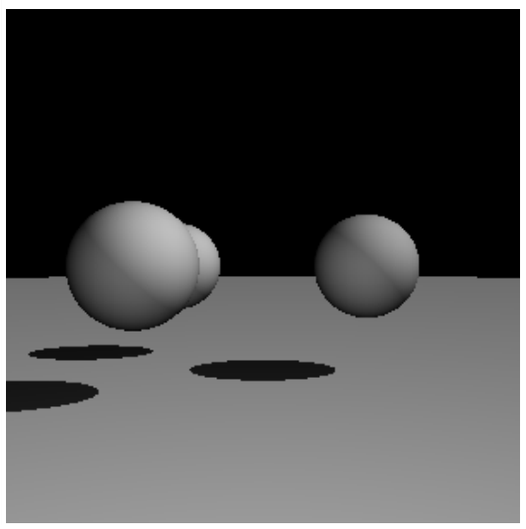
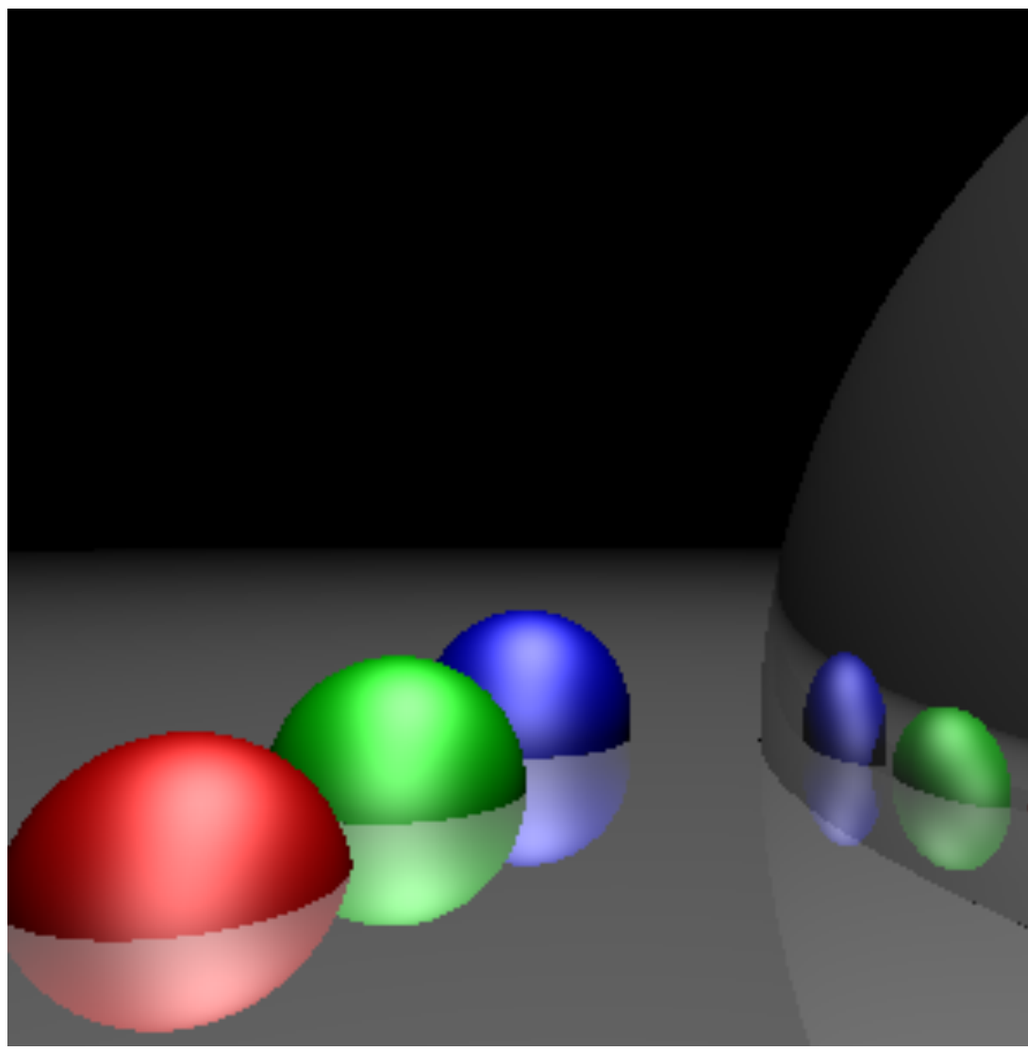





Computer Graphics

Lecture 10 (LIVE)

Mirrors, Specular Reflection, and Shadows

Announcements

- Reminder: videos (about triangles!!) for tomorrow.

A0 Artifact Vote Results

A0 Artifact Vote Results

A Decisive Victory:

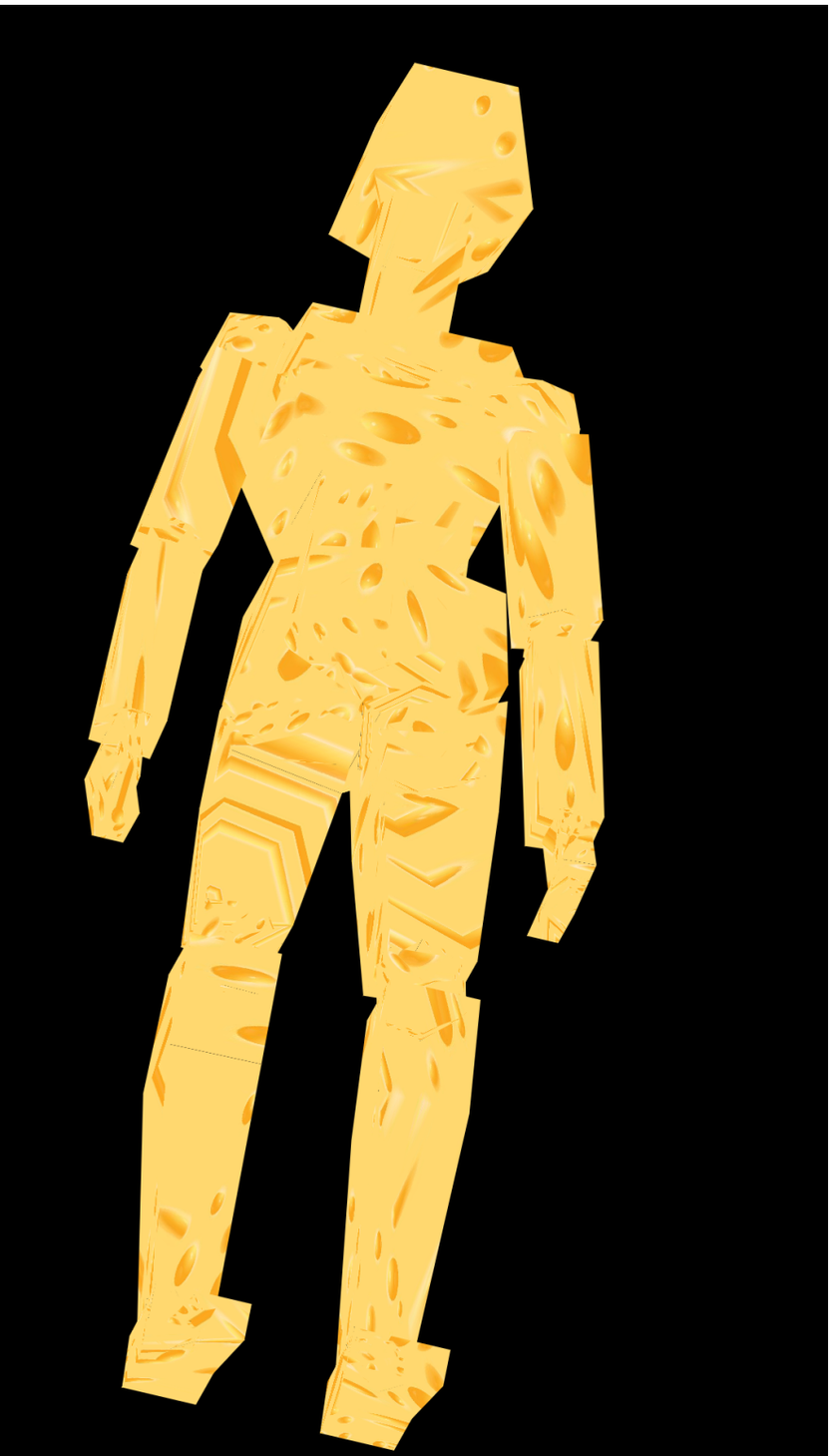
A0 Artifact Vote Results

A Decisive Victory:

Joshua Trofimczuk

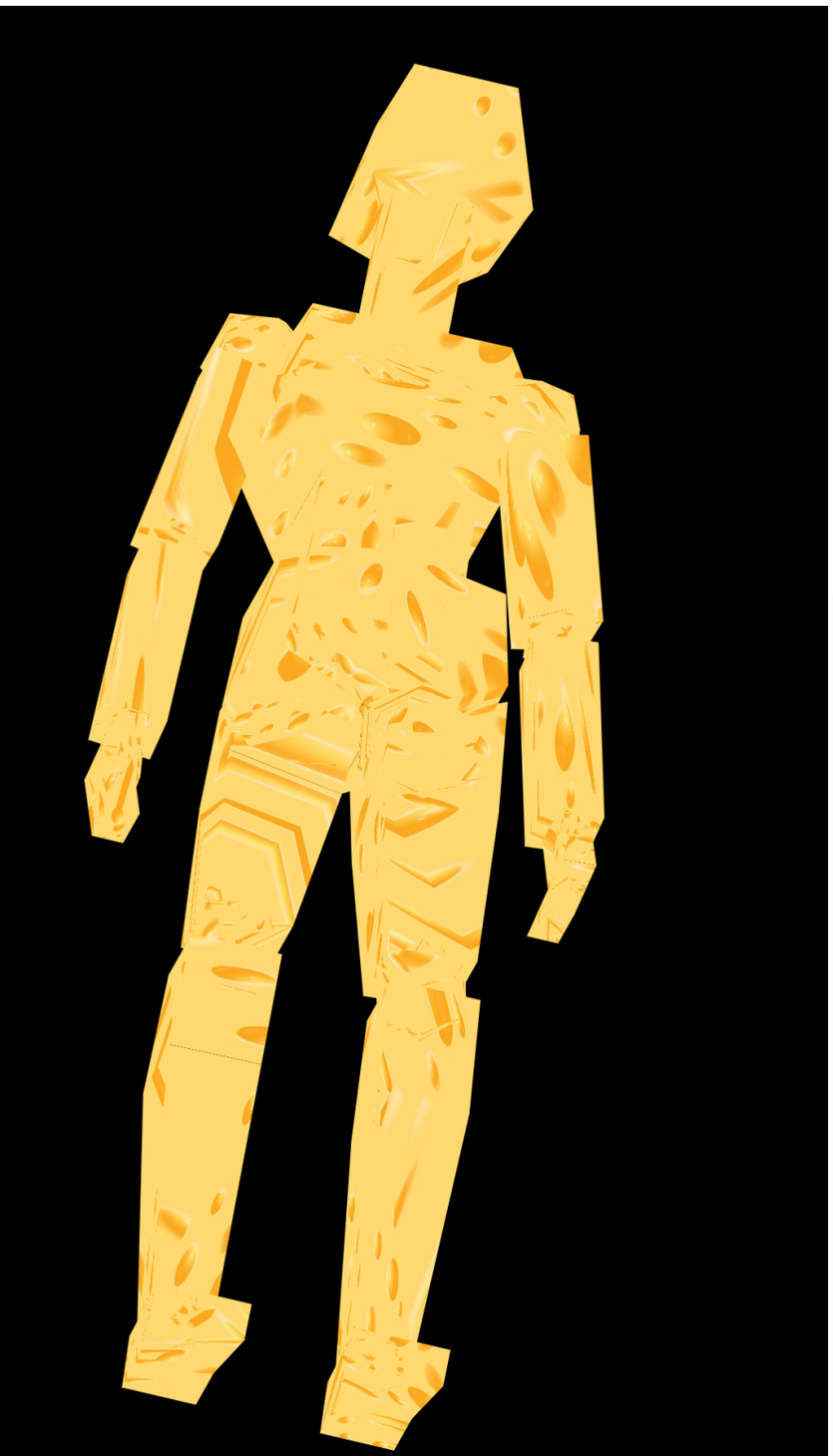
Honorable Mentions

Dylan Carroll

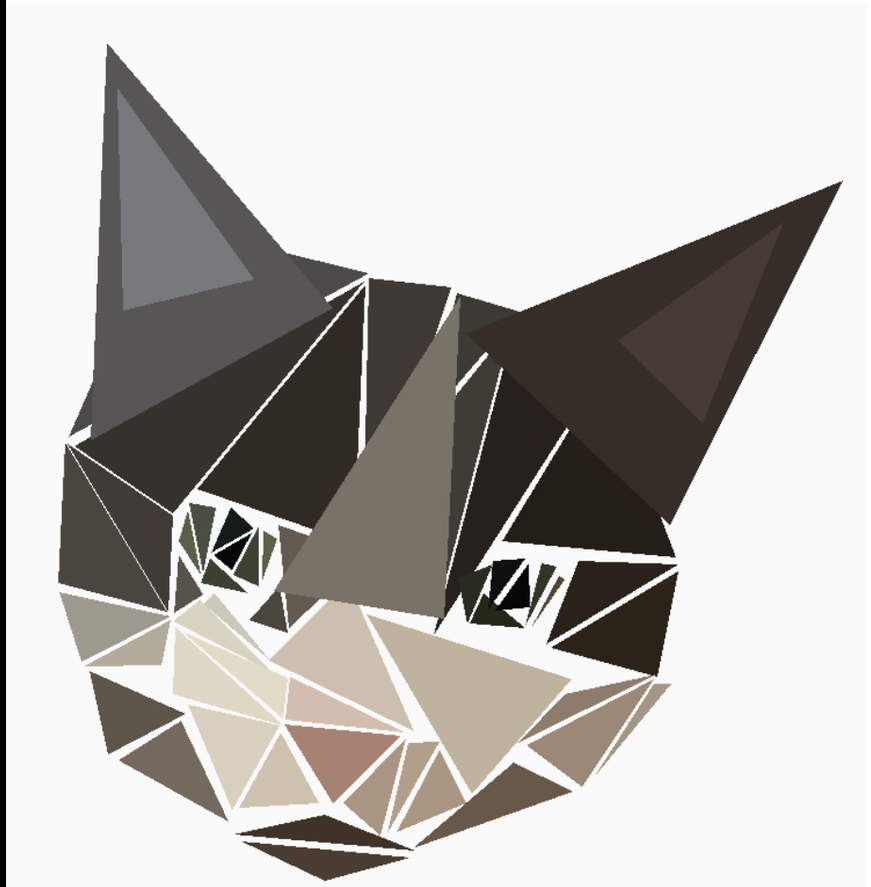


Honorable Mentions

Dylan Carroll

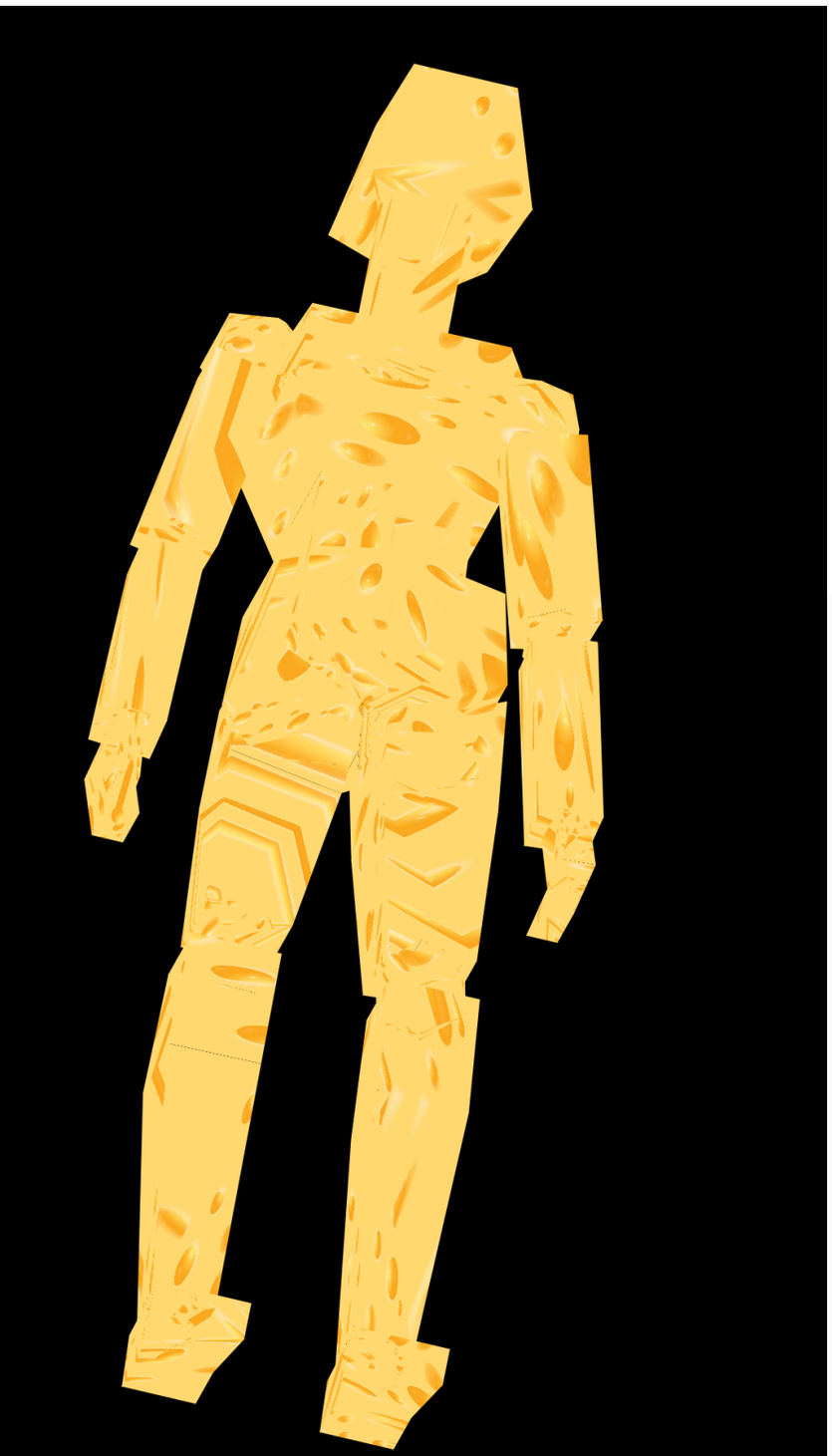


Finn Eitreim

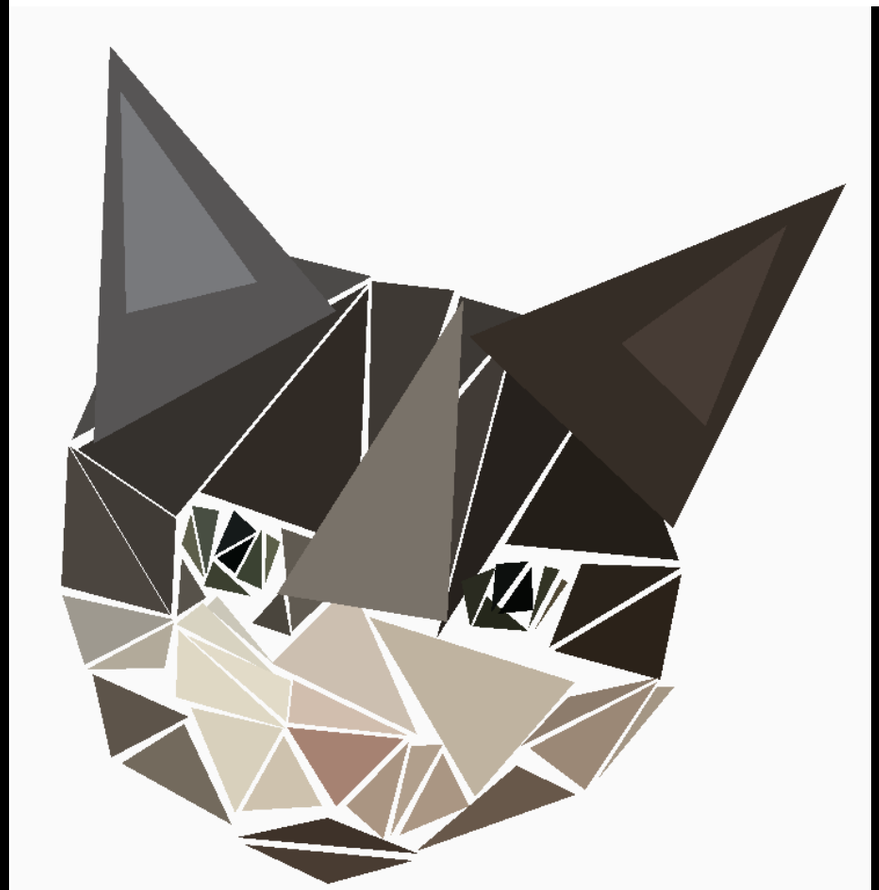


Honorable Mentions

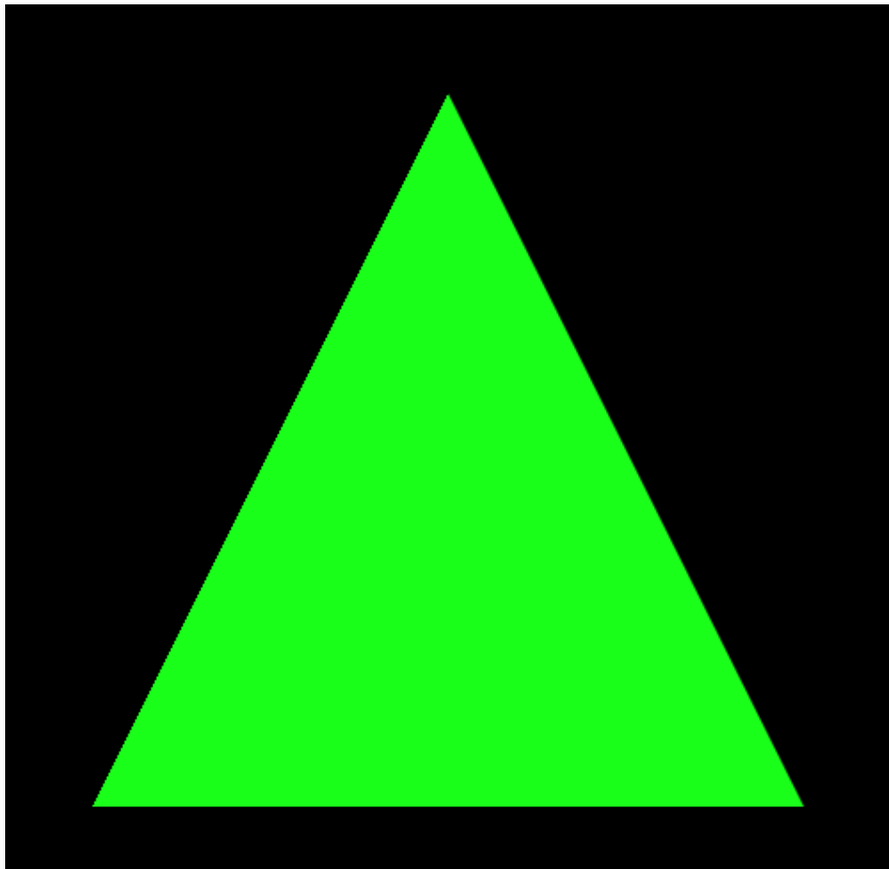
Dylan Carroll



Finn Eitreim

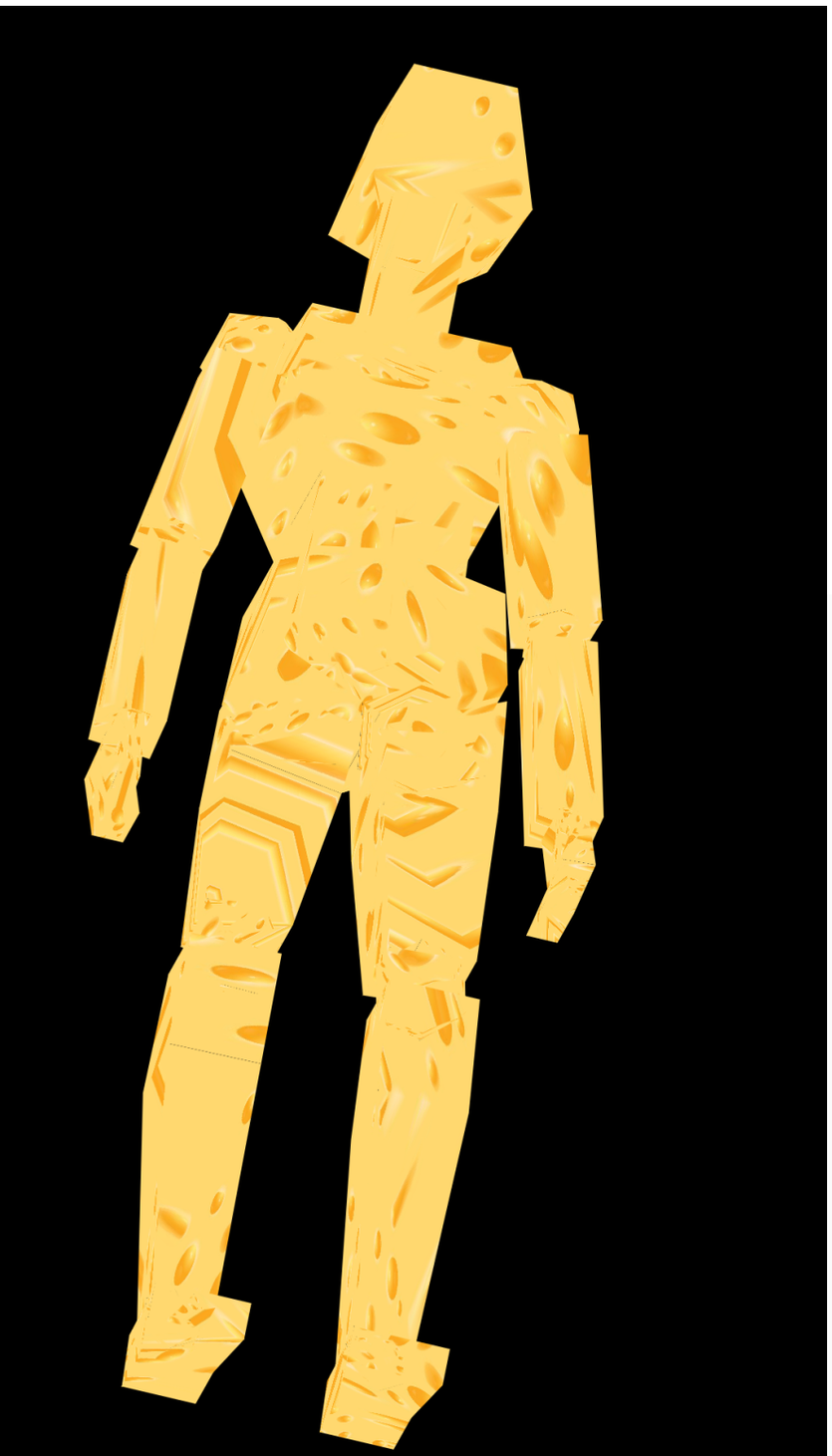


Keagan Edwards

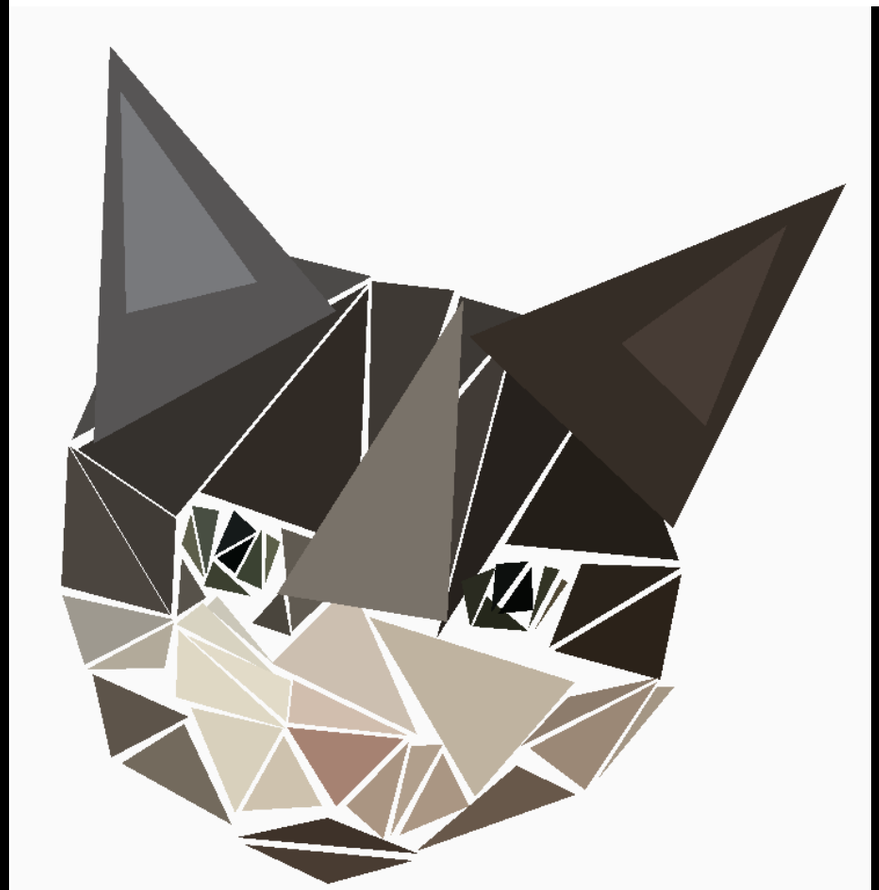


Honorable Mentions

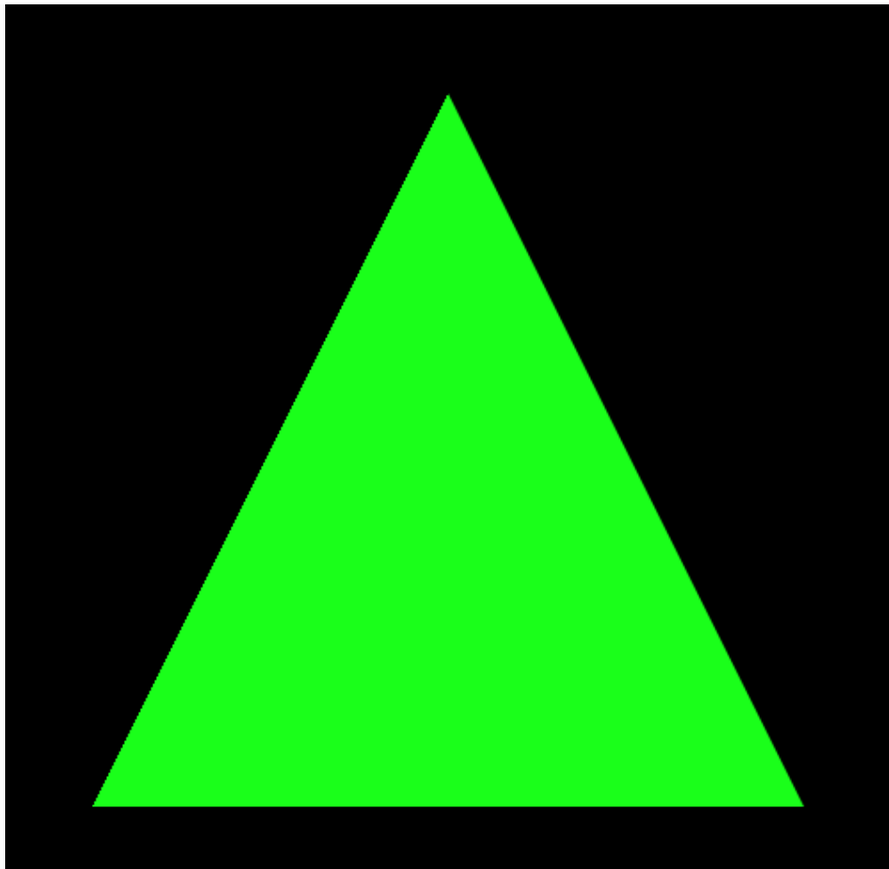
Dylan Carroll



Finn Eitreim



Keagan Edwards

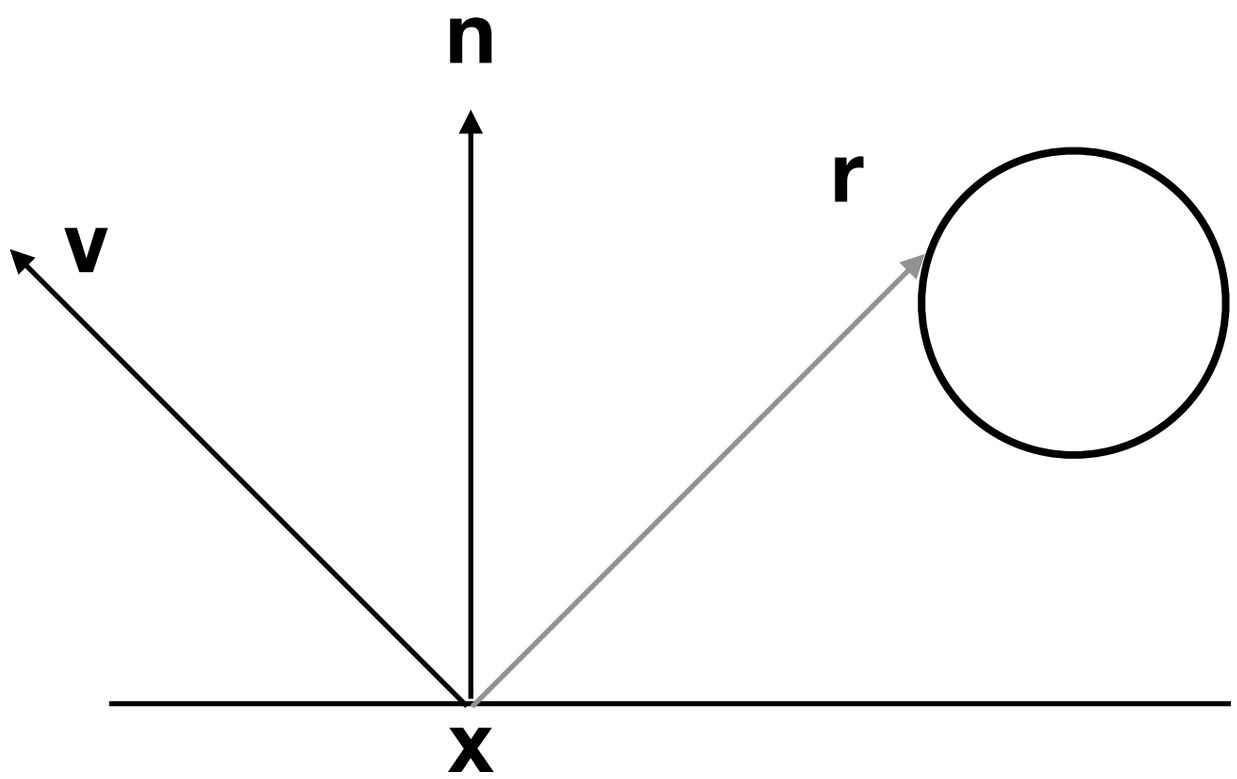


Mirror Reflection

What does a camera see when it looks at a mirror?

Calculate $\vec{r}$:

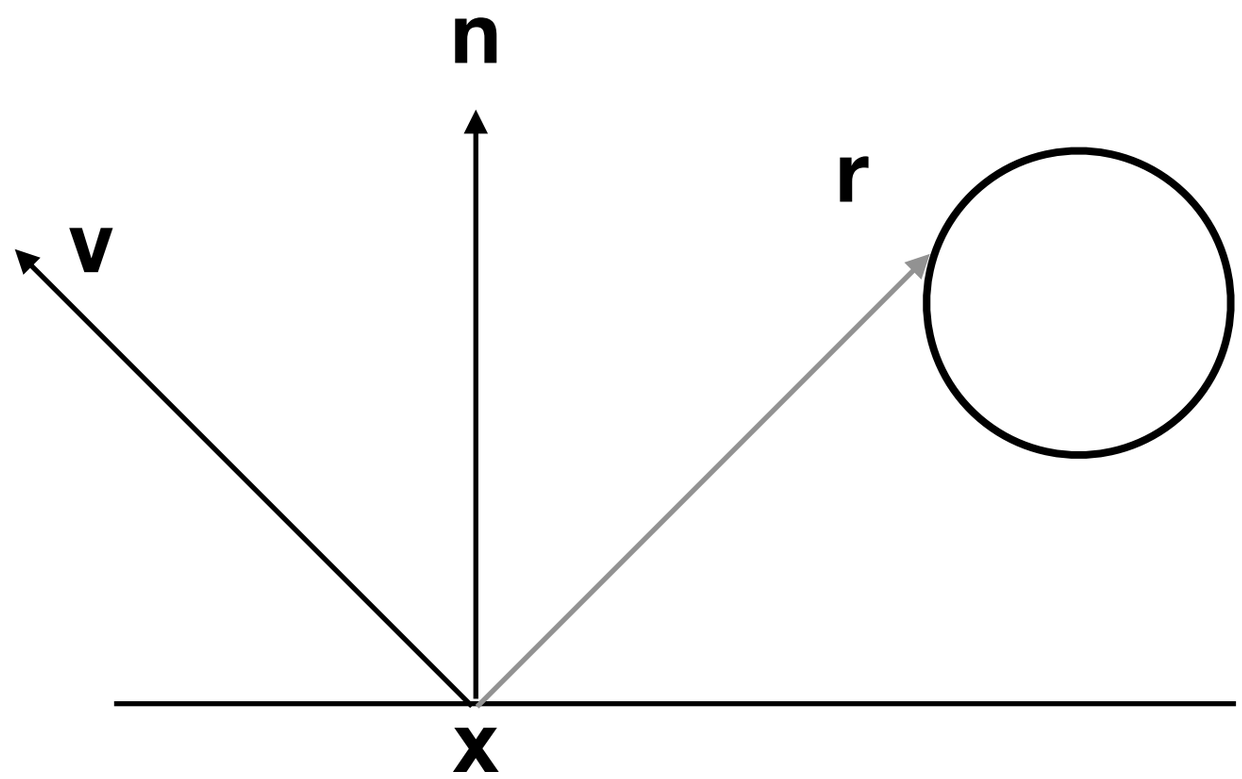
$$\vec{r} = -\vec{v} + 2(\vec{v} \cdot \vec{n})\vec{n}$$




```
mirr_ray.origin = x
mirr_ray.direction = r
```

Mirror Reflection

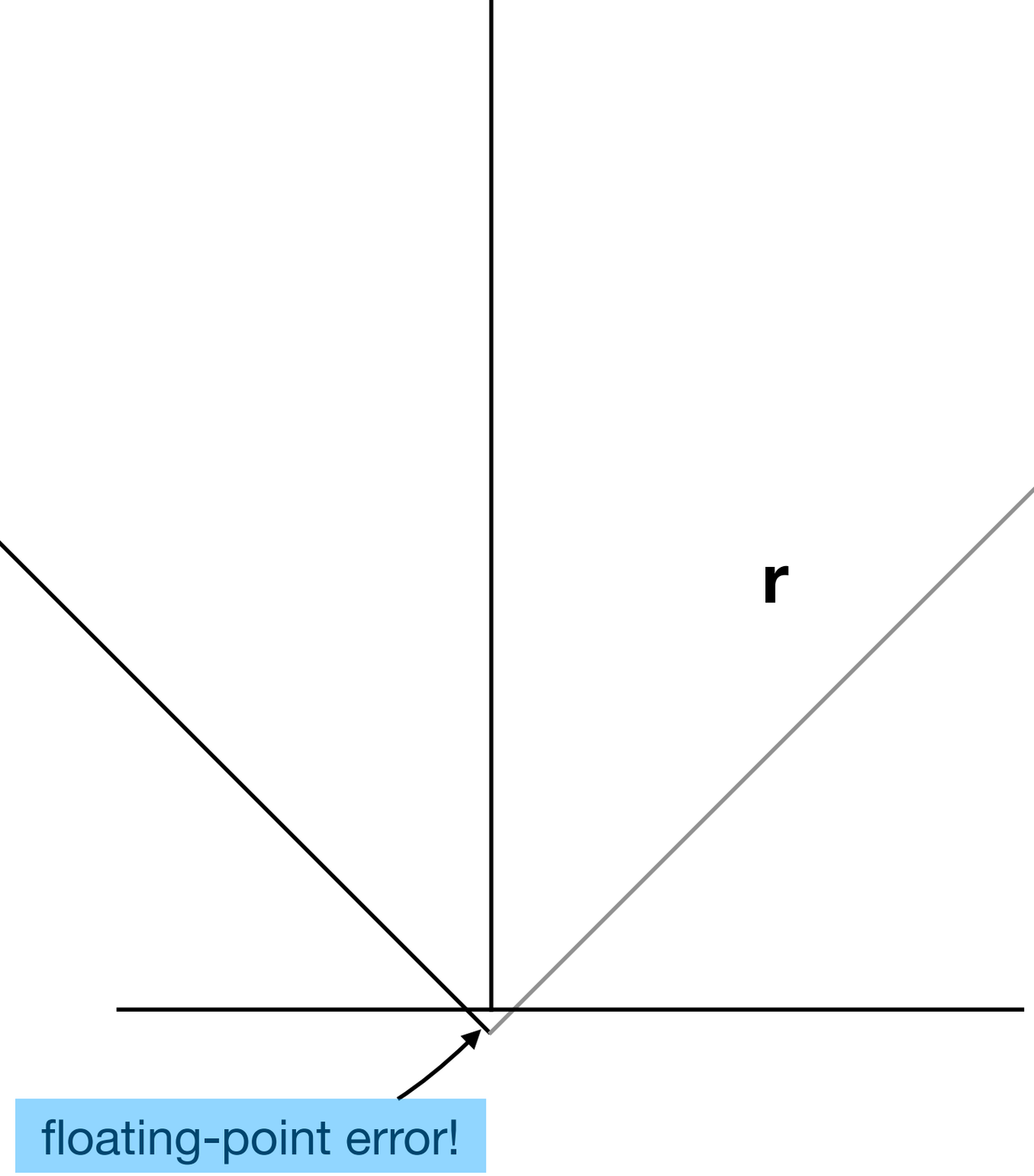
What does a camera see when it looks at a mirror?



Calculate $\vec{r}$:

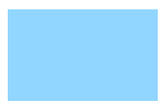
$$\vec{r} = -\vec{v} + 2(\vec{v} \cdot \vec{n})\vec{n}$$

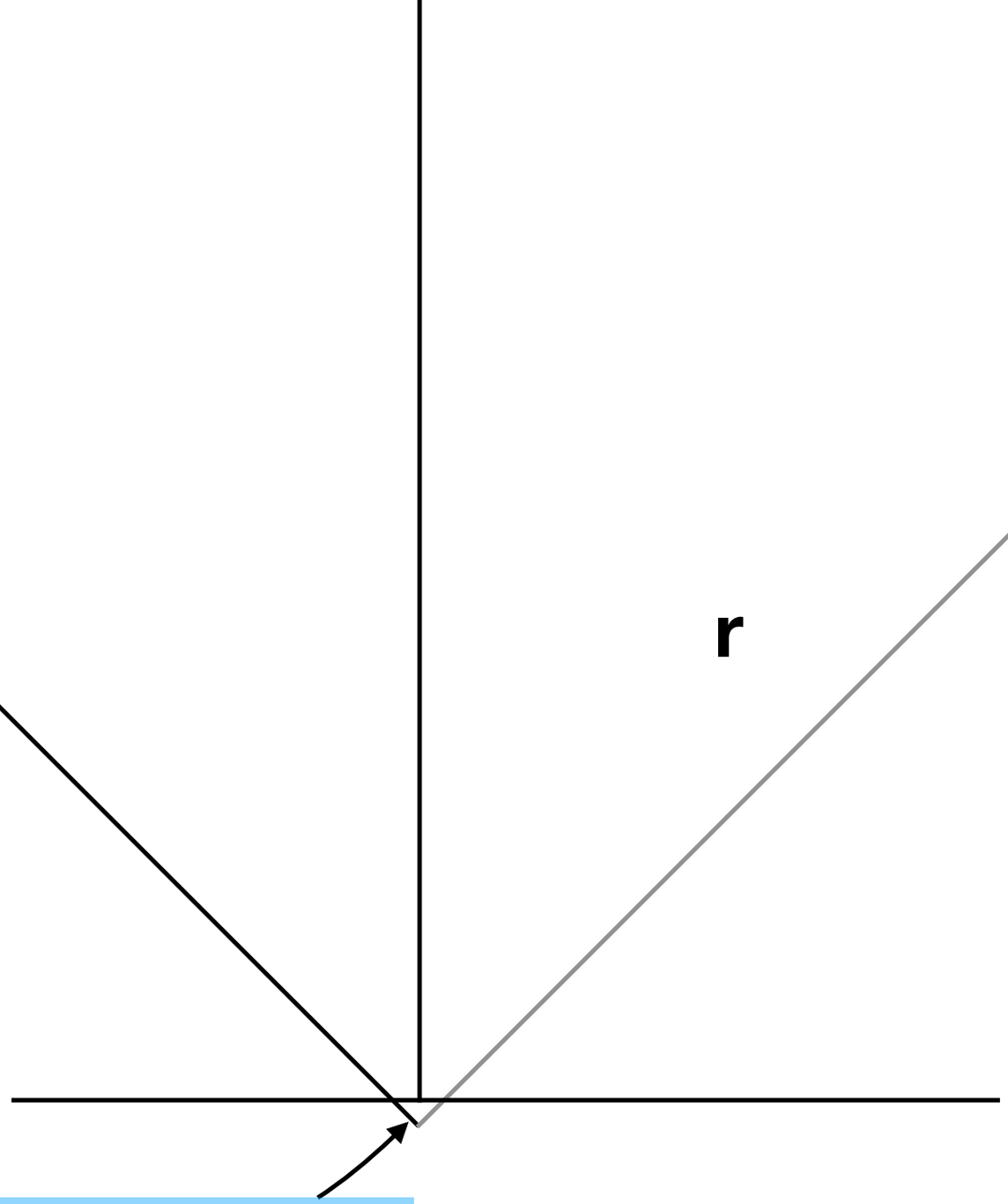
```
mirr_ray.origin = x
mirr_ray.direction = r
color = traceray(scene, mirr_ray)
```




```
mirr_ray.origin = x
mirr_ray.direction = r
```

tmin tmax






```
mirr_ray.origin = x
mirr_ray.direction = r
color = traceray(scene, mirr_ray, eps, Inf)
```

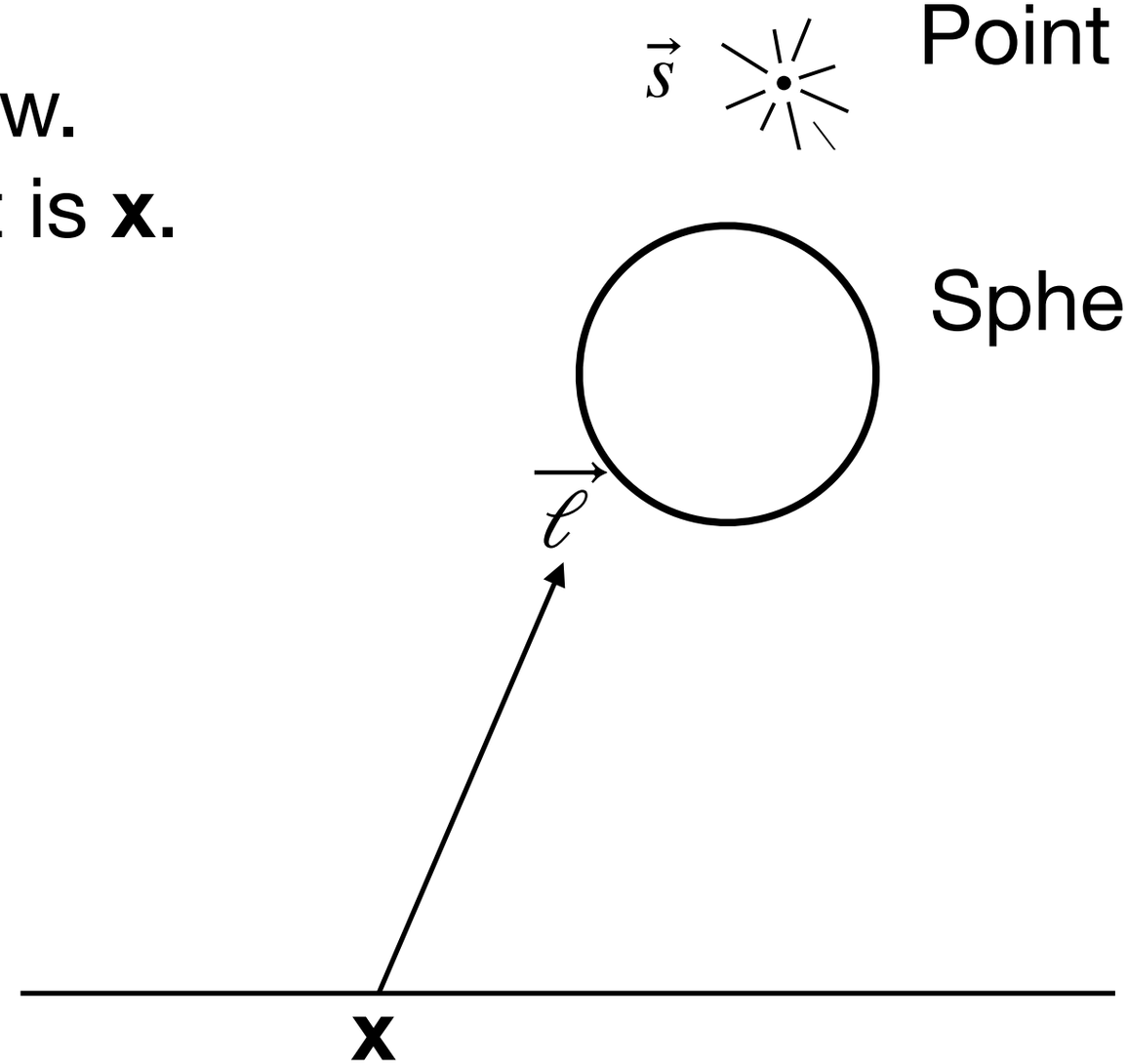
tmin tmax

Shadows

How can we tell if a point is in shadow?

Problem: Fill in the table below.
Assume the intersection point is **x**.

	Directional light $\vec{\ell}$	**Point light** $\vec{s}$
`r.orig`		
`r.dir`		
`tmin`		
`tmax`		



Point is shadowed iff:

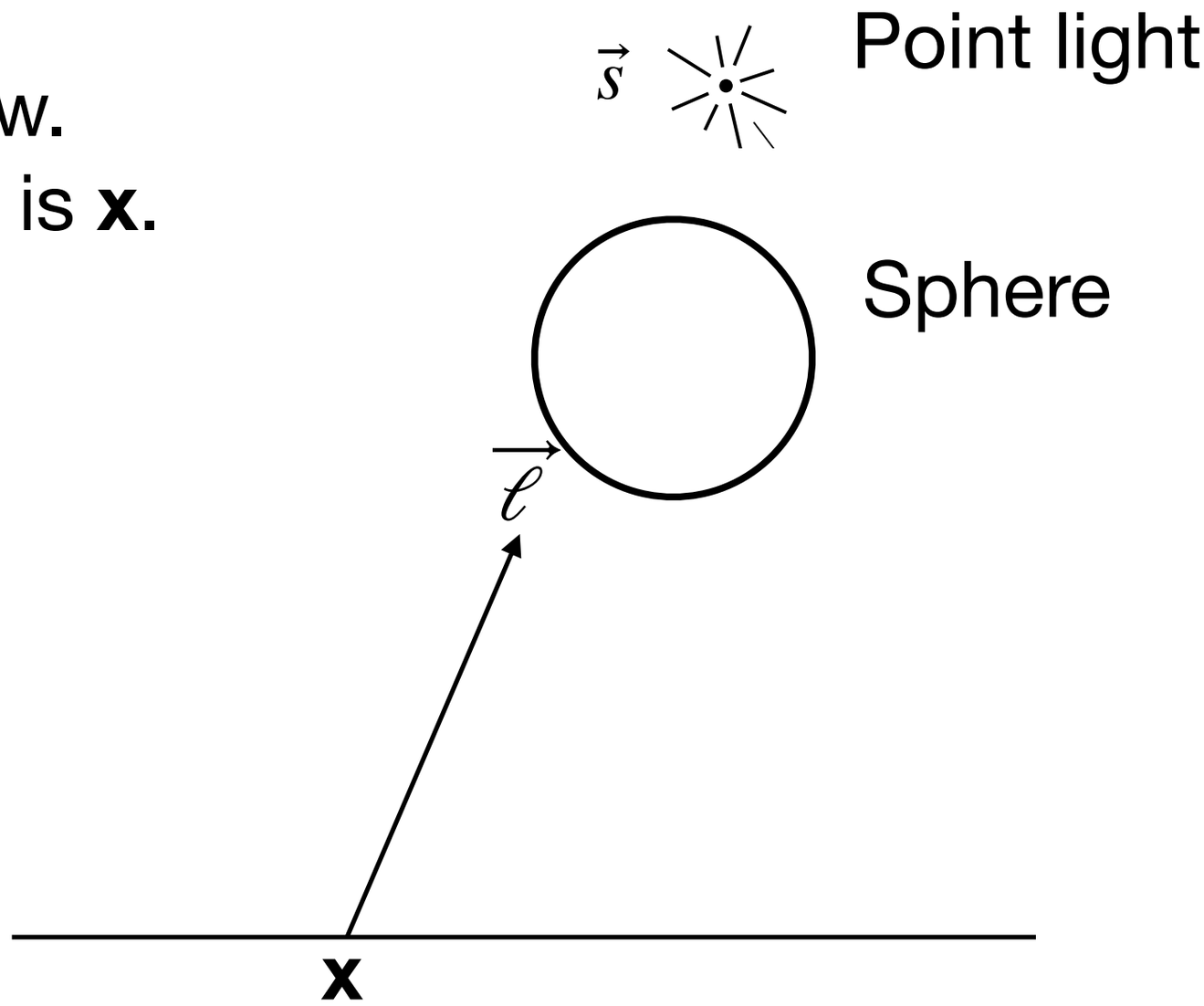
```
closest_intersect(objs, Ray(orig, dir), tmin, tmax) != nothing
```

Shadows

How can we tell if a point is in shadow?

Problem: Fill in the table below.
Assume the intersection point is **x**.

	Directional light $\vec{\ell}$	**Point light** $\vec{s}$
`r.orig`	x	x
`r.dir`	$\vec{\ell}$	$\vec{s} - \mathbf{x}$
`tmin`	eps	eps
`tmax`	Inf	1



Point is shadowed iff:

```
closest_intersect(objs, Ray(orig, dir), tmin, tmax) != nothing
```