Timely Rays: using data-flow to accelerate rendering

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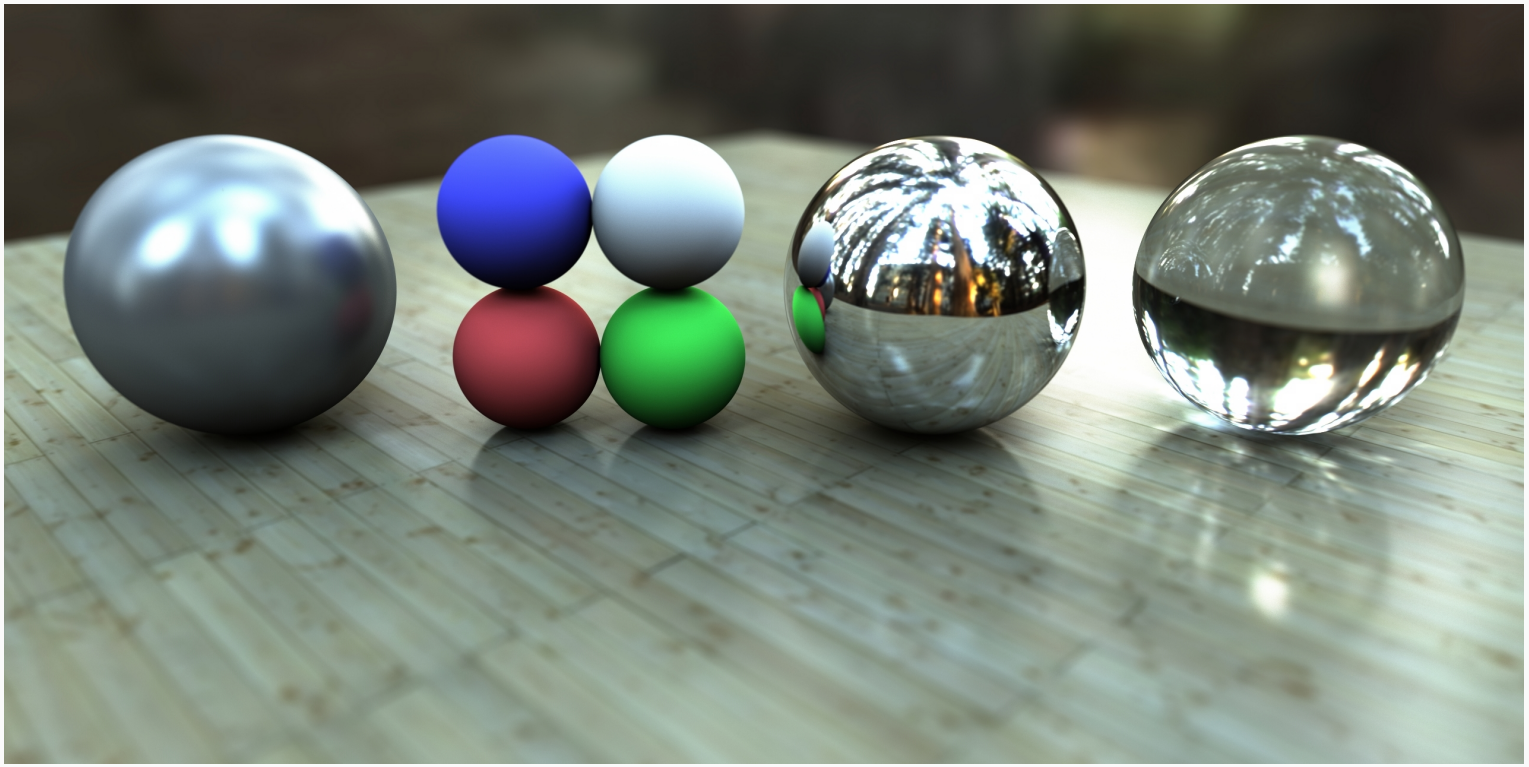
U. of Cam

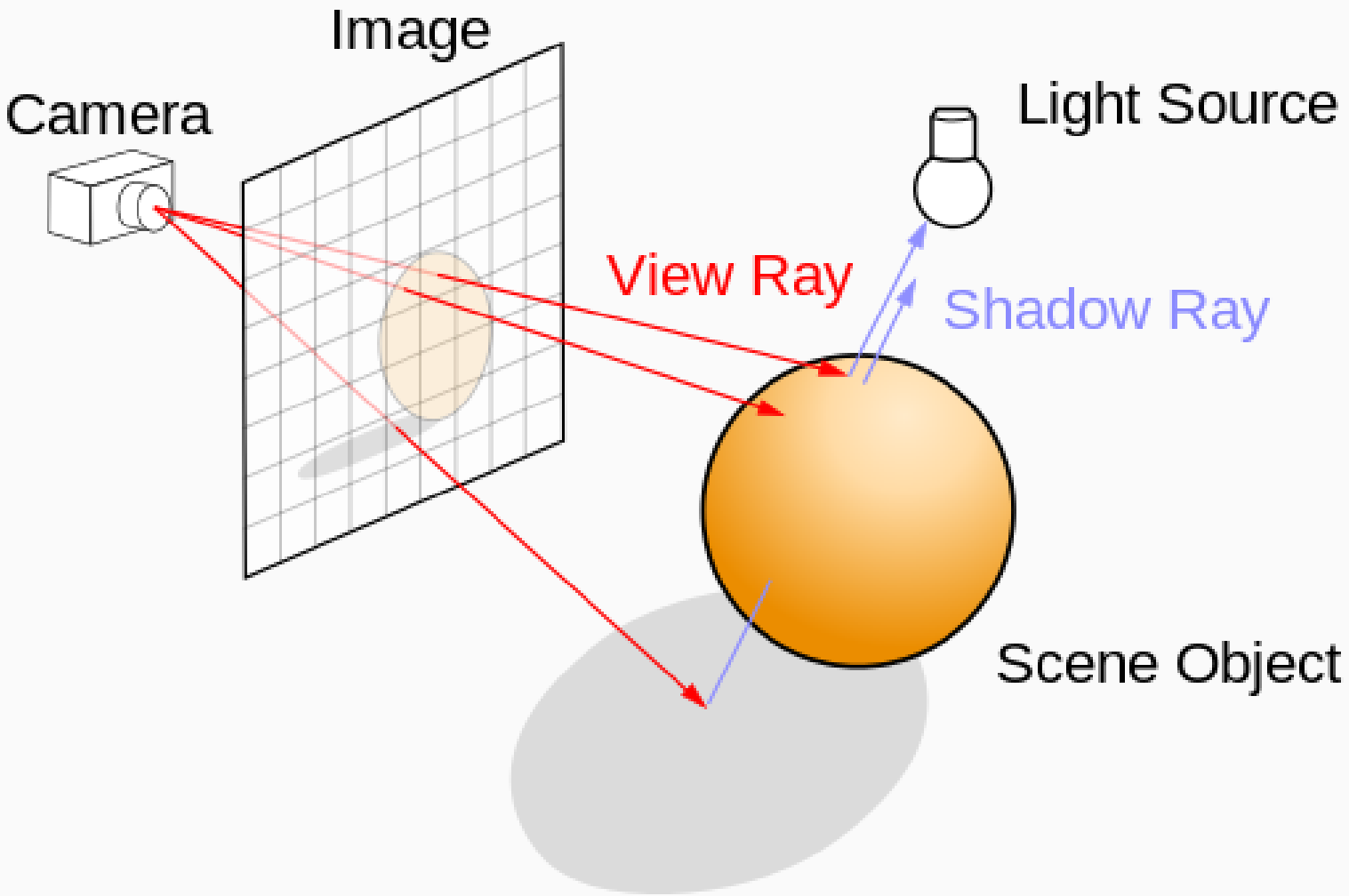
Introduction

What is a RayTracer?



Photorealistic Easy to understand Slow

How do they work?



Timely Dataflow

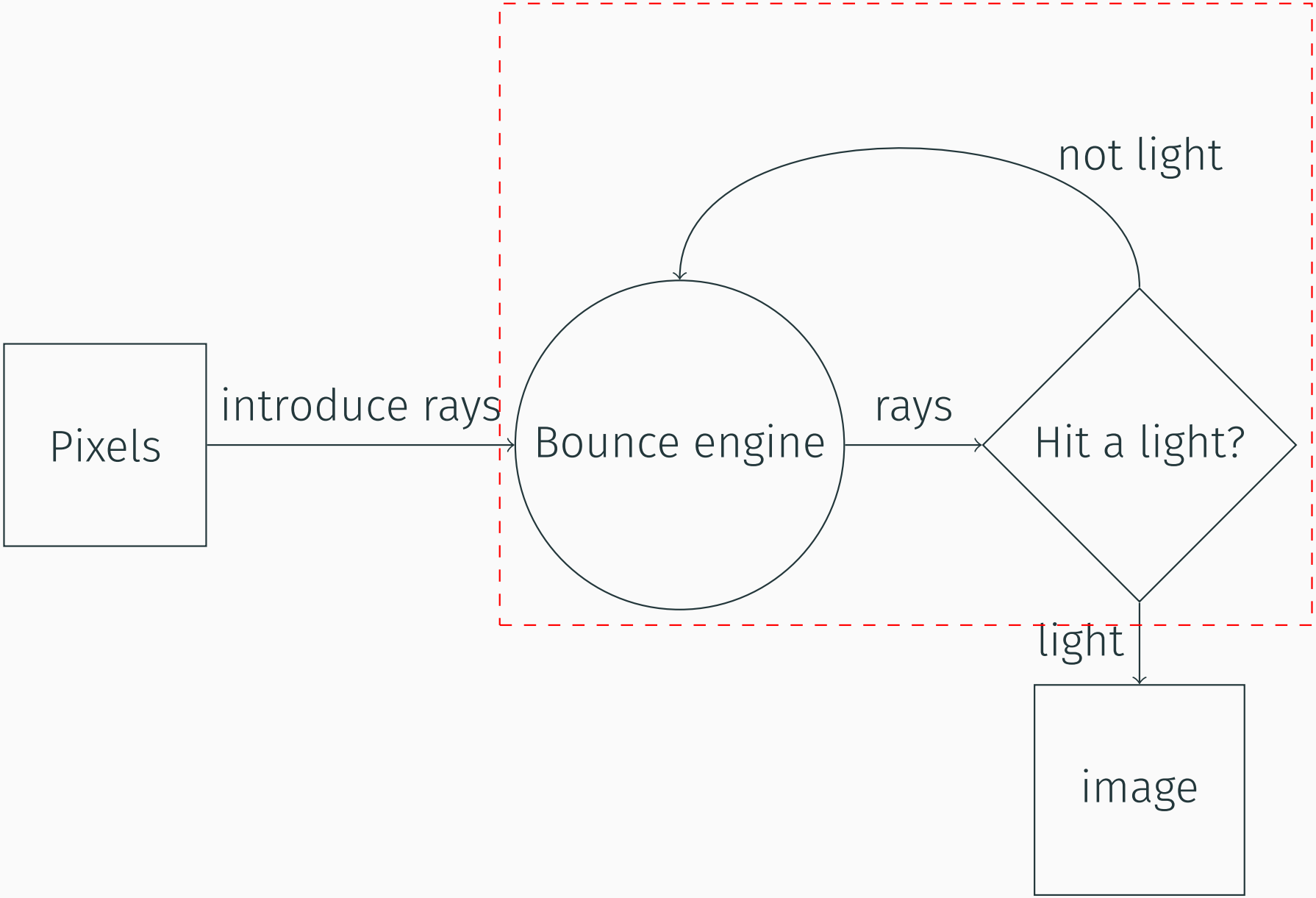
What is a Timely Dataflow?

~~Timely dataflow is a low-latency cyclic dataflow computational model~~

~~Nat's description was lovely, thank you.~~

Jesse's presentation from week 3 was excellent, refer to that.

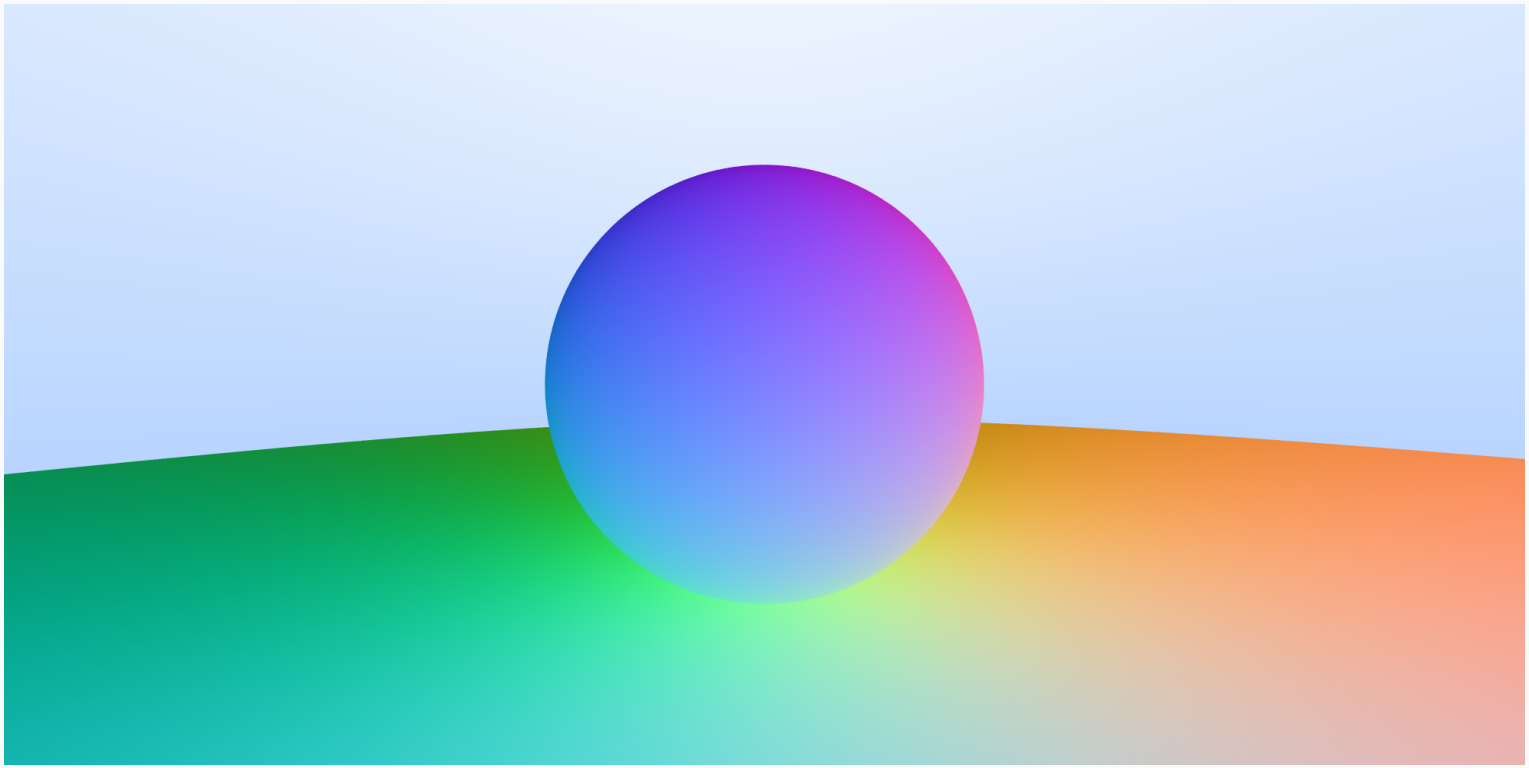
Flowing rays



Progress Report

Single scene

It looks like this:



One object and one material

Only implemented a single shape, a single internally-illuminated material, and a single scene.

```
enum Hittable {
    Sphere(Sphere),
    // Rect(Rect),
    // Ngon(Ngon), // Hybrid modes!
    // RichardSpencer() // is a Hittable
}
```

One thread

```
let captured = timely::example(move |scope| {
    pixlocs.to_stream(scope)
           .map(move |loc| {
              (loc, get_color(loc))
           )
           .accumulate(EMPTYIMG,
                       |IMG, data| {
                           IMG[locs] += data;
                       })
           .capture()
});
```

Early days yet! Perhaps this will be the next Cycles.

Thank you!