We started by talking about real time rendering for games.

There are many many tricks in rendering for games. You can see the long running SIGGRAPH course “Advances in Real-Time Rendering” for a collection of examples, which changes every year.

http://advances.realtimerendering.com/s2016/

All of the talks are available online through CMU’s access to the ACM digital library. For example, here are the links to the 2016 version of the course:

http://dl.acm.org/citation.cfm?id=2940291
http://dl.acm.org/citation.cfm?id=2940292

There is too much ground to cover here, so I decided to have a look at one specific example. We spoke about the following paper:

https://www.youtube.com/watch?v=ZLRgEN7AQgM

We also saw a little bit of the efforts of the team at Ubisoft to transform this idea into a reliable and useful production tool.

We then switched to production rendering for movies. Movies have a greater computational budget, but it still is not infinite. As a specific example, we spoke about the rendering technology that was used in Big Hero 6. It is based on the following paper:

http://www.andyselle.com/papers/20/

As an introduction, we watched this video, starting from 3 minutes in:
https://www.youtube.com/watch?v=y6yrHkZVGf8

Results show that 100X speedup can be obtained by sorting rays and ray hits.
We then took a look at recent research related to rendering specific phenomena: rendering scratches, downsampling cloth, and rendering granular materials such as sand:


And we can't talk about rendering without bringing in the idea of non-photorealistic rendering. This paper is interesting because it considers the variety of paths light can take when interpreting an artist's sample painting of a sphere to apply to arbitrary scenes and geometries: