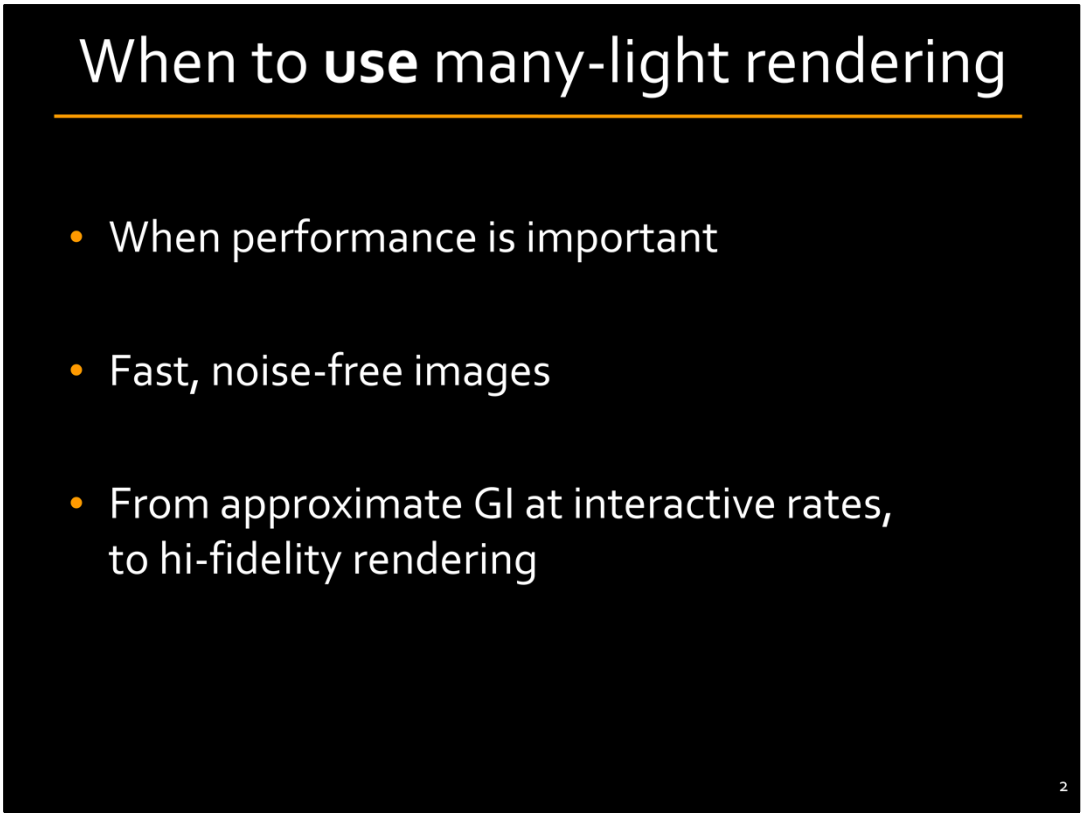
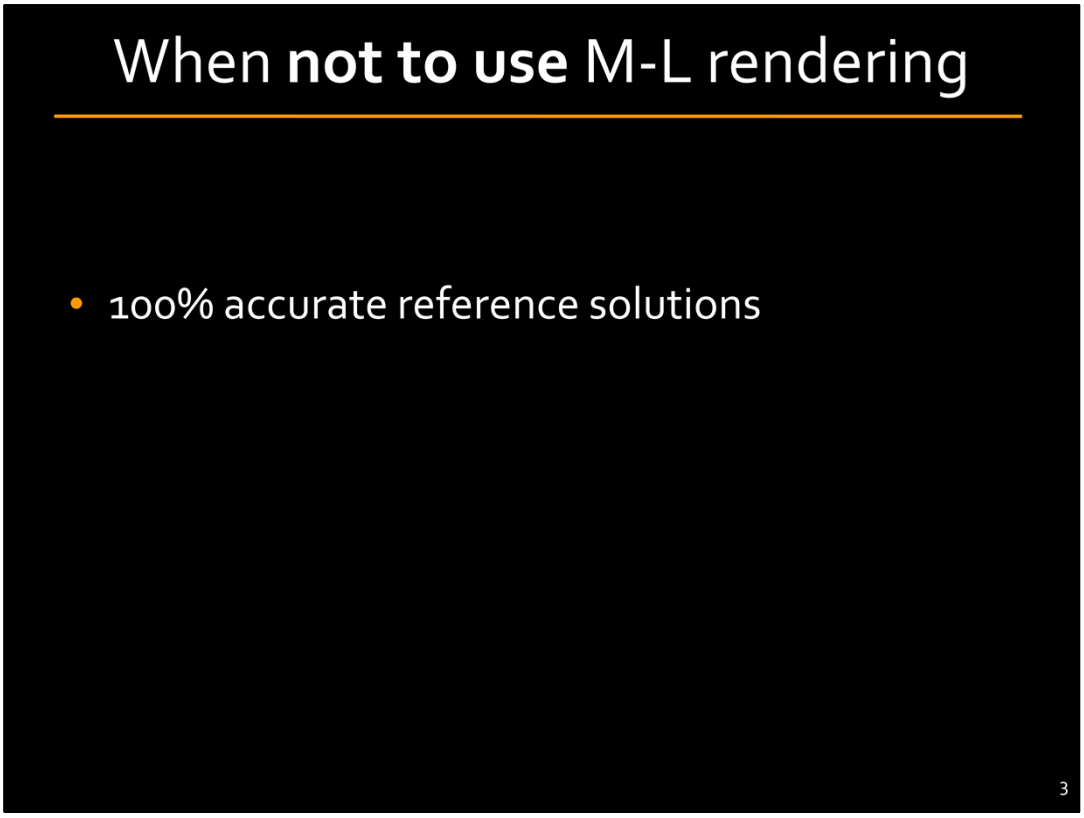
(Optimizing) Realistic Rendering with Many-Light Methods

Conclusion



Let me give a brief conclusion of the entire course. I'd like to conclude by giving you some general hints on when it's good to use many-light methods, when it's better to look for another solution, and finally what the next research challenges in this area are.
First, I want to say that many-lights rendering methods are a very good choice when rendering performance is important (that is to say, nearly always ;-)). Indeed, unlike Monte Carlo methods, many-light rendering can provide a noise-free images at a very short time.
Traditionally, many-light rendering may have been perceived as a fast but *approximate* global illumination solution. However, the recent developments have turned them into a solution able to provide truly high-fidelity images, without loosing their good performance.



To be completely fair, we have to stress that many-light method are not yet able to produce a completely accurate solution for light transport. Some lighting effects, such as caustics form curved surfaces, are still impossible to render with many-light methods. So if you application absolutely needs 100% accurate reference solutions, you may want to look elsewhere (MC methods, progressive photon mapping).

M-L rendering – Research challenges

- Making M-L rendering 100% accurate
  - Hybrid solutions?
- Improving performance
- Volumetric scattering

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This limitation also suggests the challenge for many-light rendering research: We really need to make the M-L methods 100% accurate, so that the range of their applications is not limited in any way. How exactly this should be done is an open question but smart hybrid solutions is certainly a ways to go. We want to keep the good performance of M-L rendering while achieving unbiasedness / consistency (that is, convergence to the true solution of the rendering equation in the mathematical sense).
Of course, we need work on improving performance. Especially, work on better VPL distribution is necessary (and already underway).

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Course materials: google the courses title

Thank you!

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