

Accelerating Rendering of NURBS Surfaces by Using Hybrid Ray Tracing

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Universität Koblenz-Landau

COMPUTERVISUALISTIK





AUGENBLICK

FAST NURBS RAYTRACING

v4 experimental





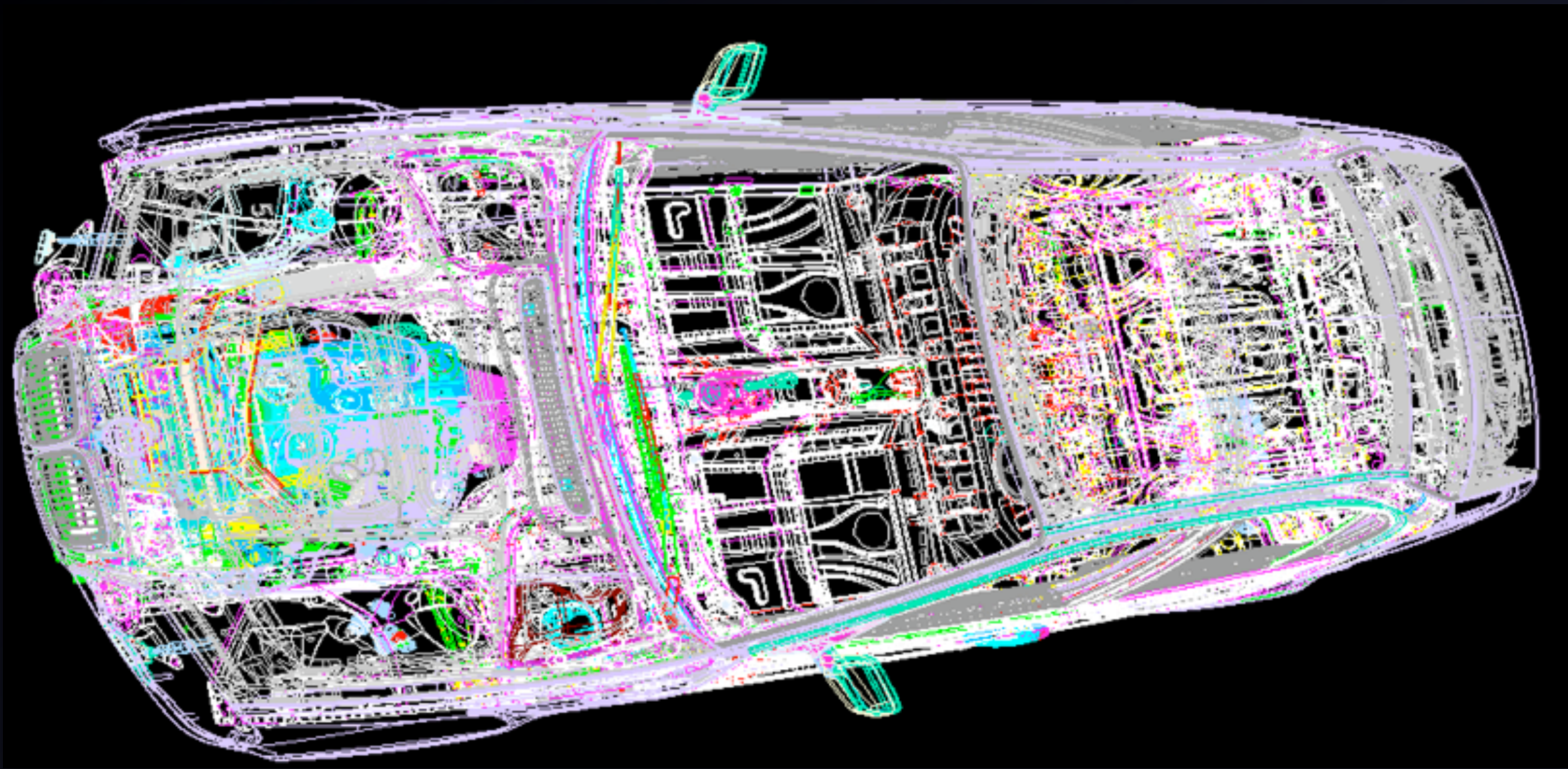
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FAST NURBS RAYTRACING

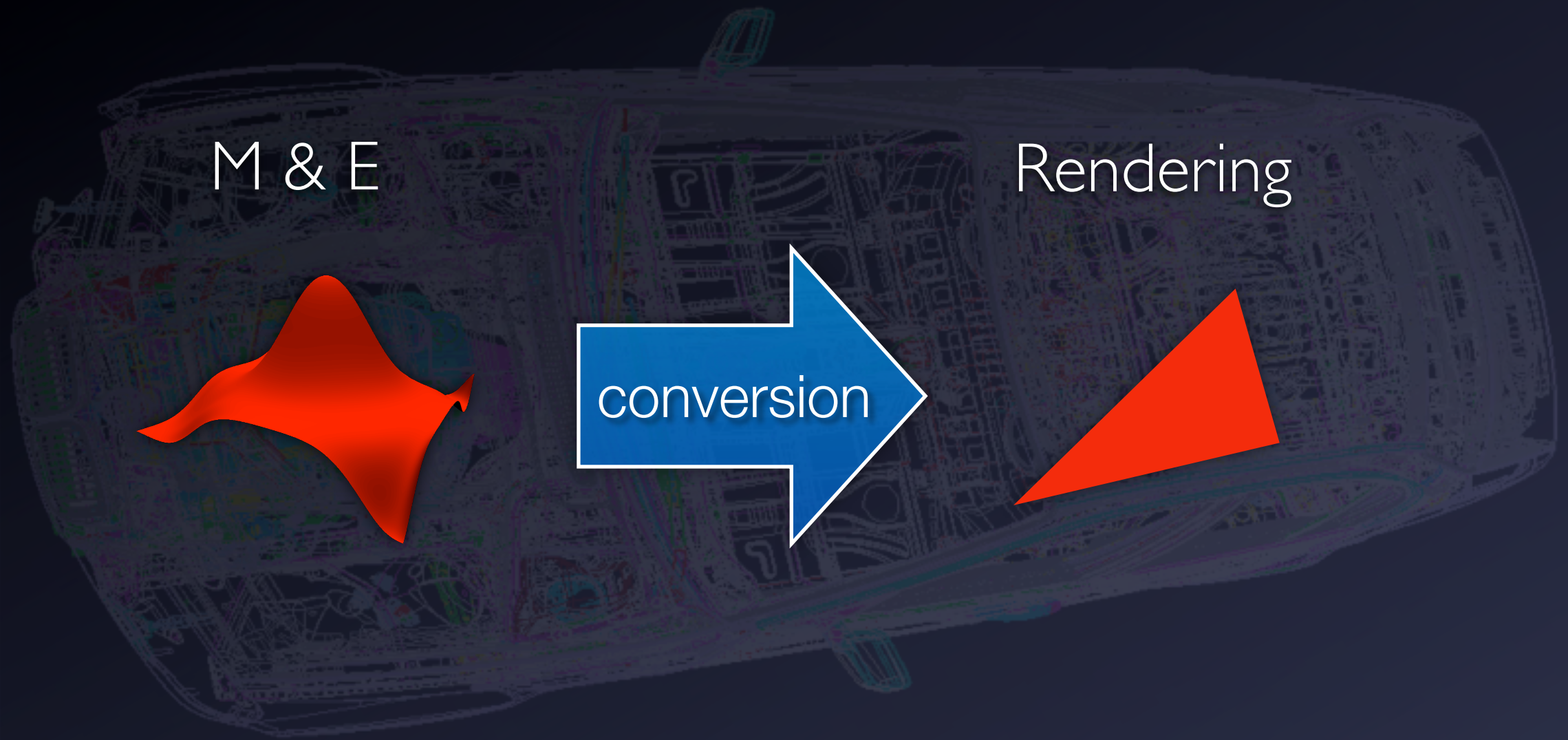
v4 experimental

v5 commercial

why?



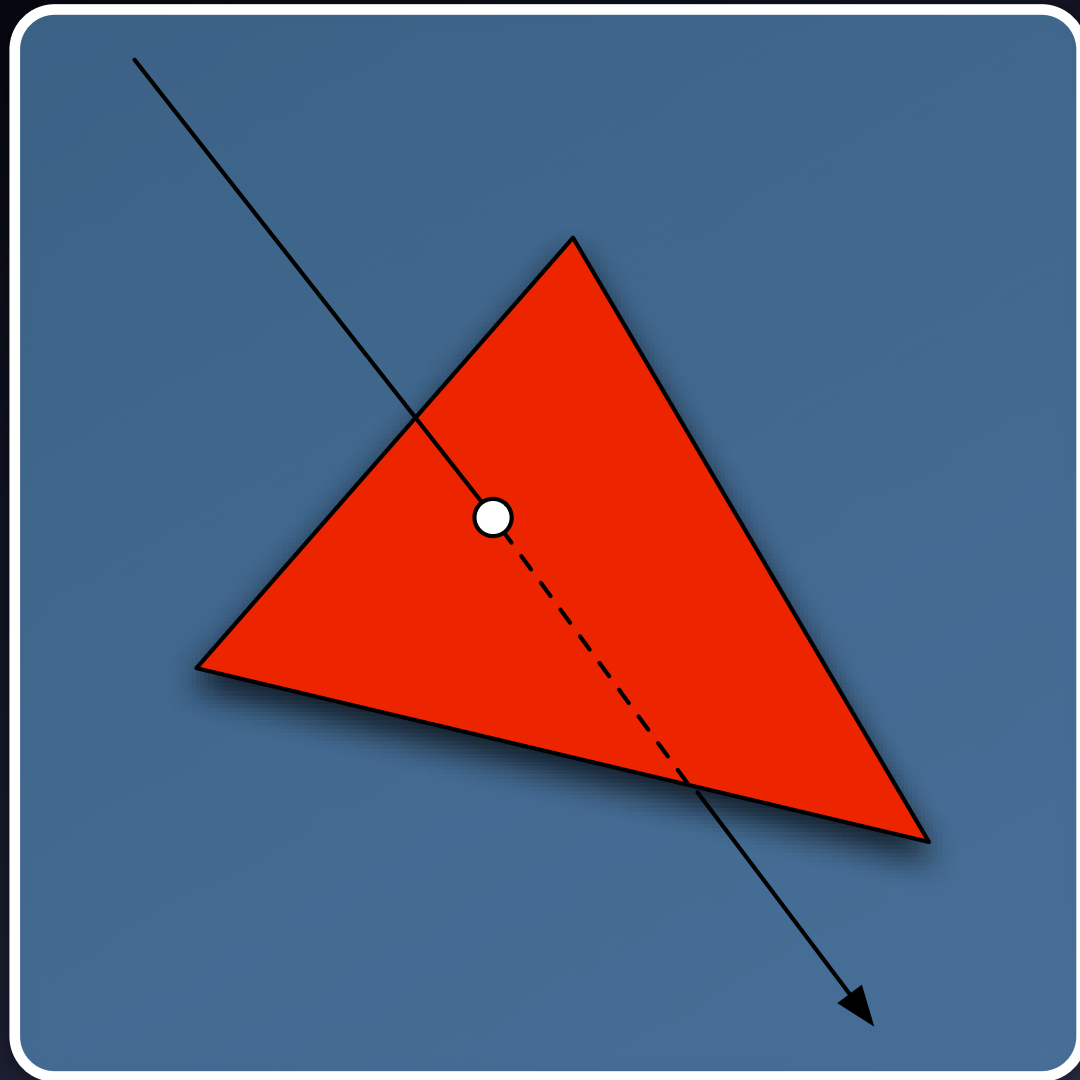
Modeling & Engineering



Modeling & Engineering

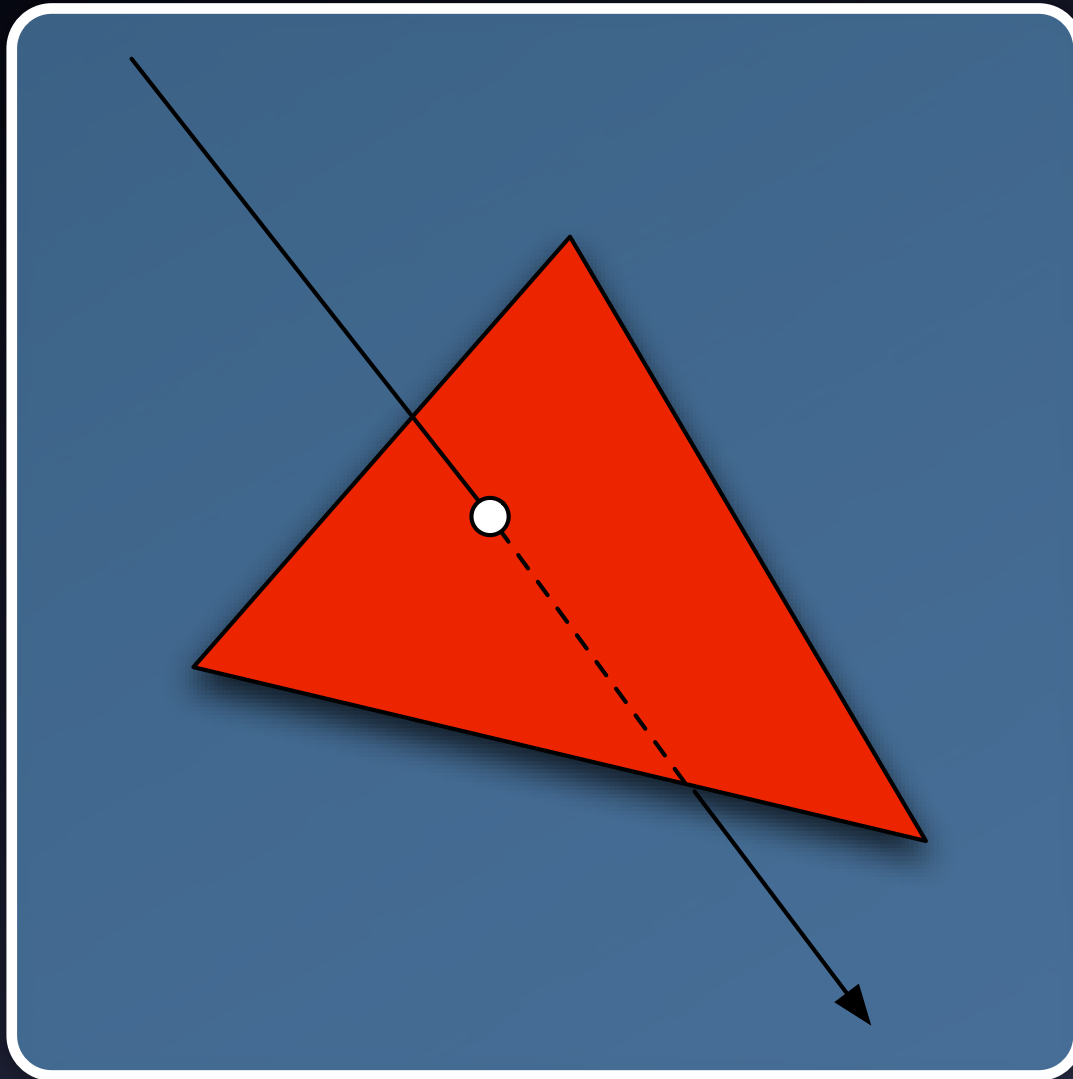
Ray Tracing NURBS

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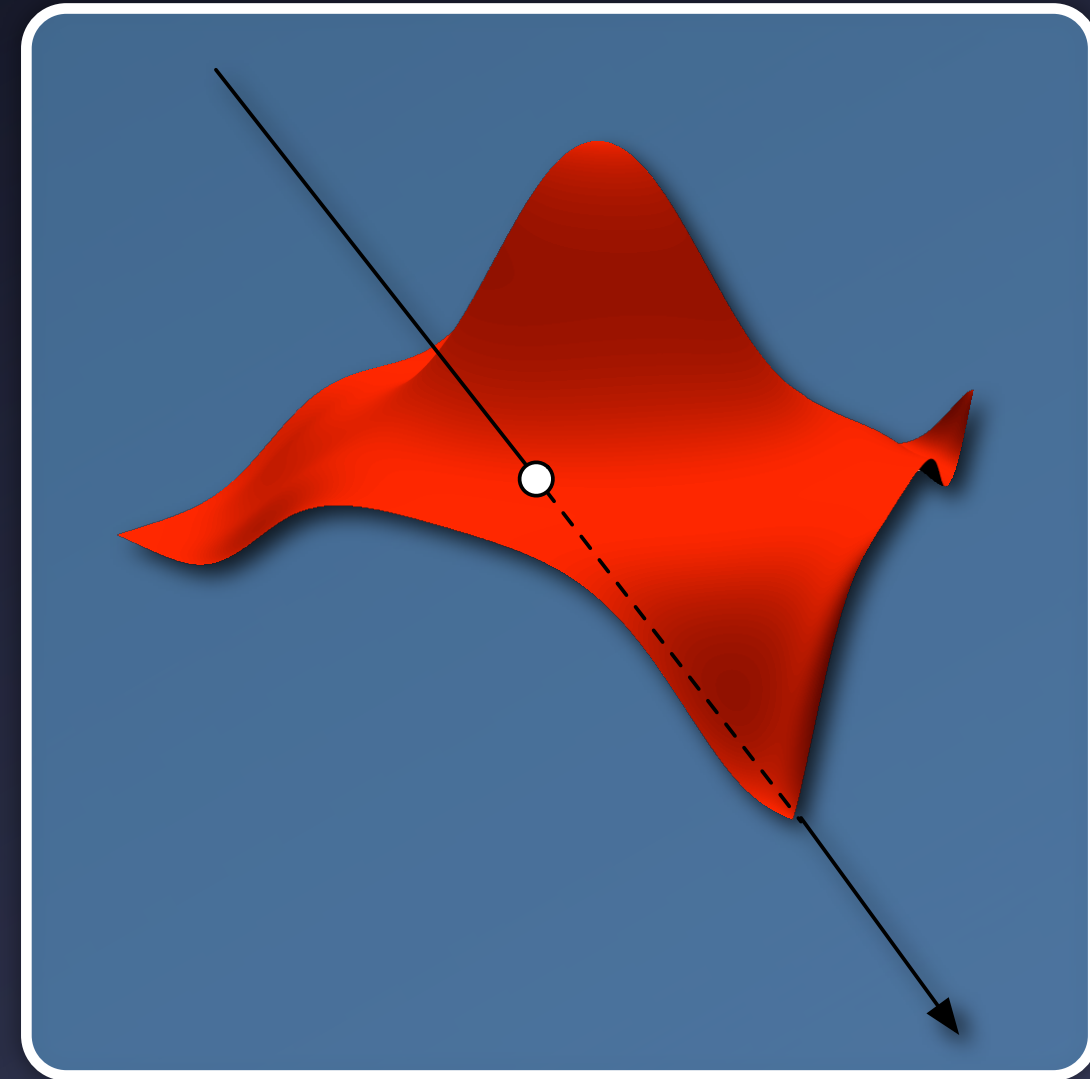


easy & fast

Ray Tracing NURBS



easy & fast



complex & slow

Ray Tracing NURBS



easy & fast

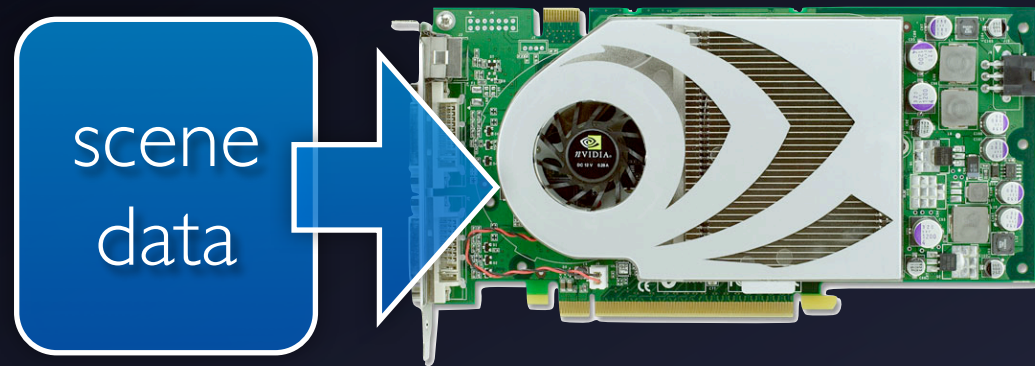


complex & slow

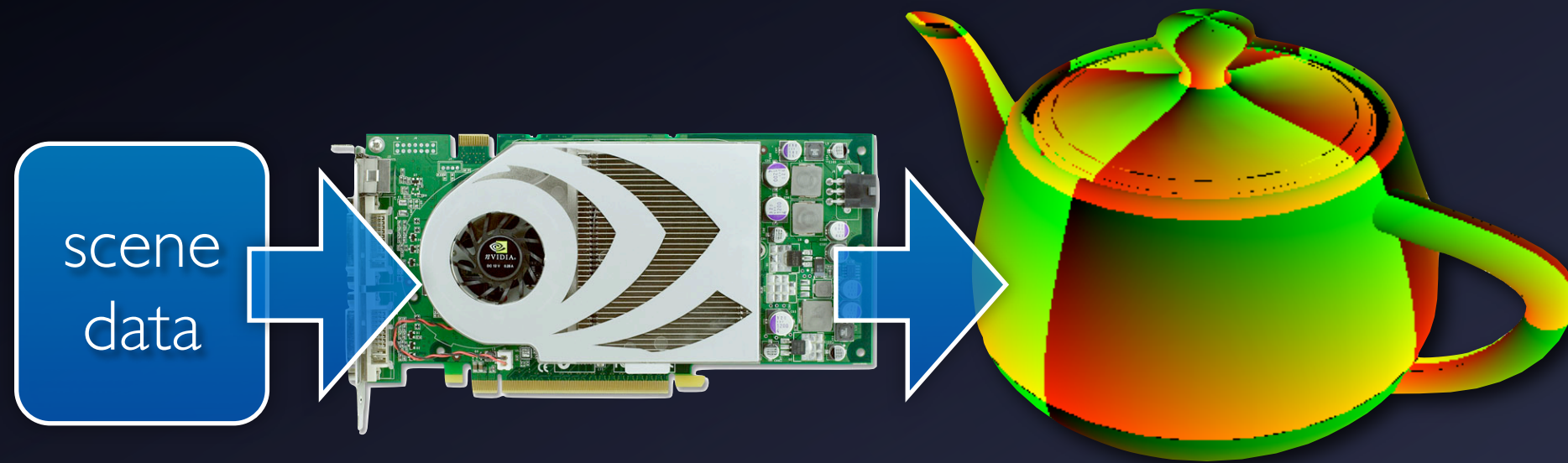
Our Hybrid Ray Tracing Approach

scene
data

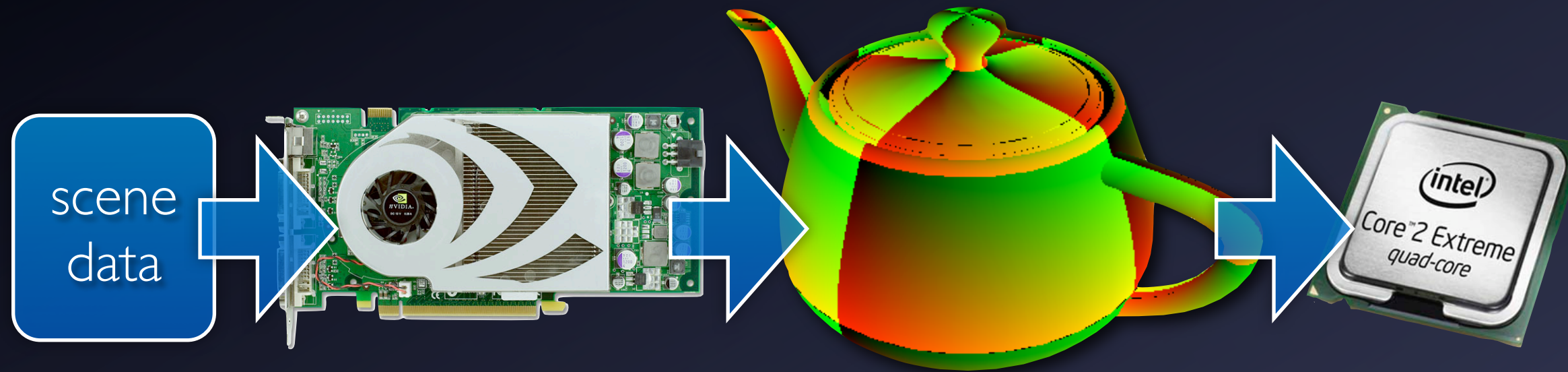
Our Hybrid Ray Tracing Approach



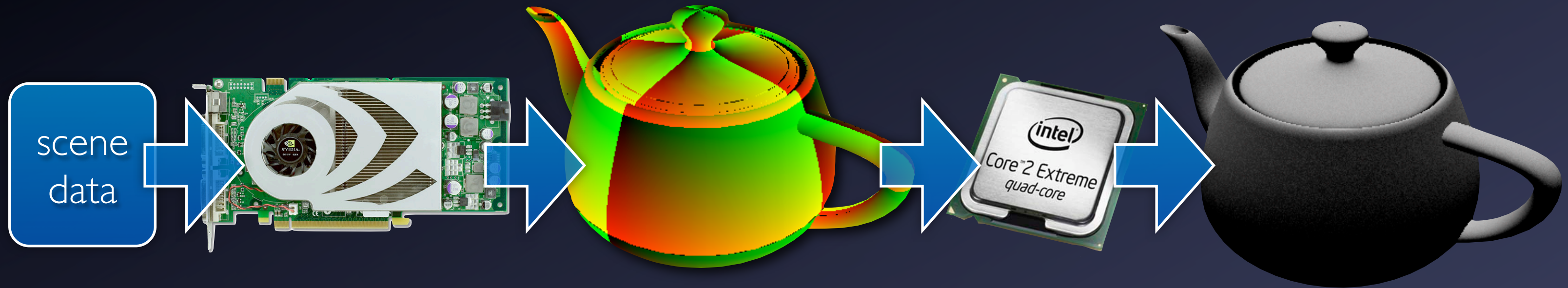
Our Hybrid Ray Tracing Approach



Our Hybrid Ray Tracing Approach

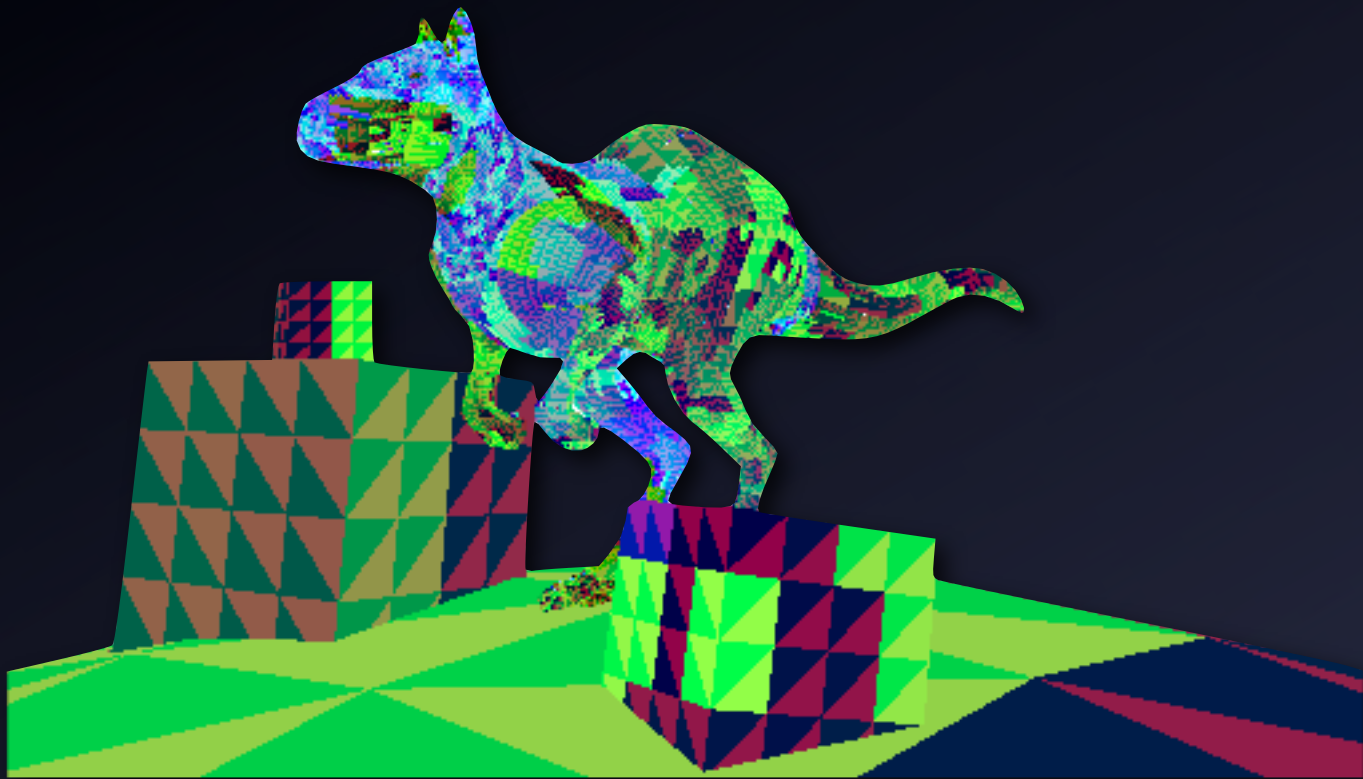


Our Hybrid Ray Tracing Approach



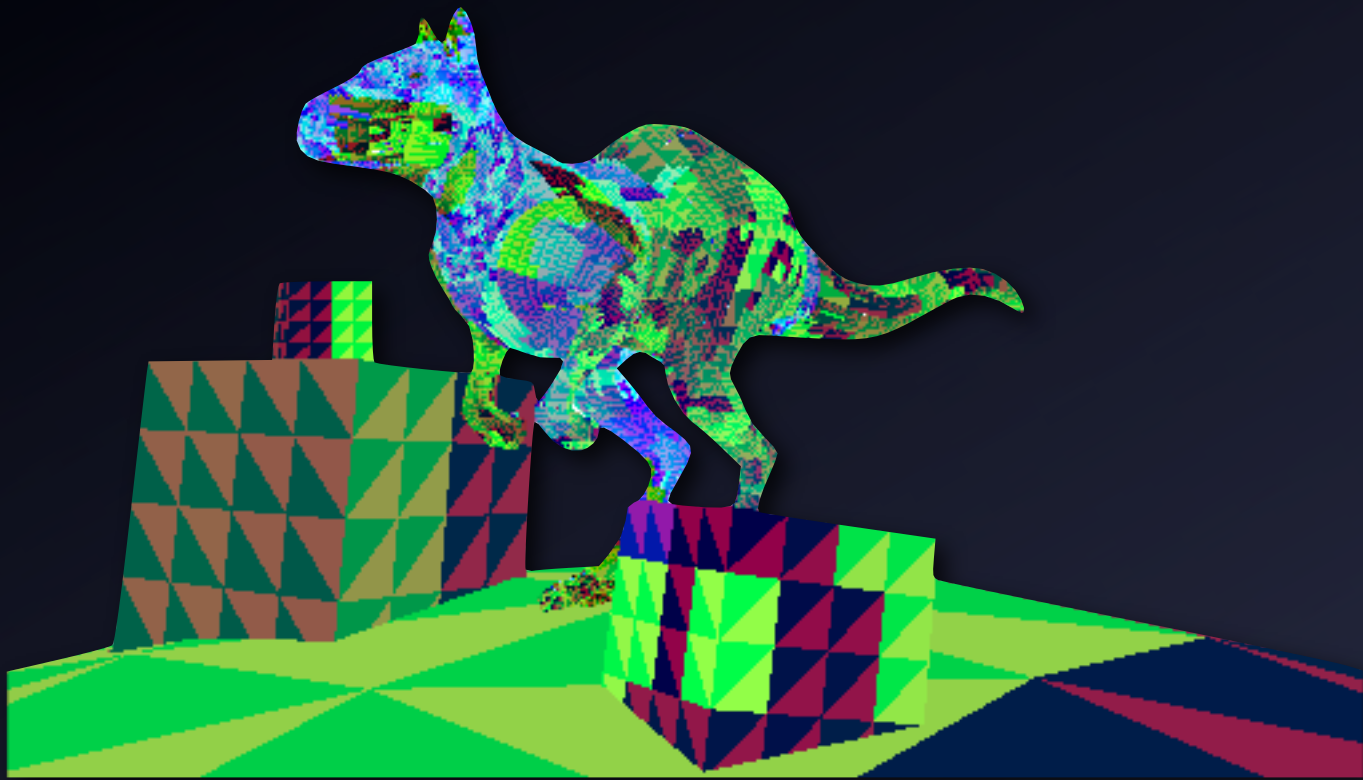
Our Hybrid Approach

Our Hybrid Approach

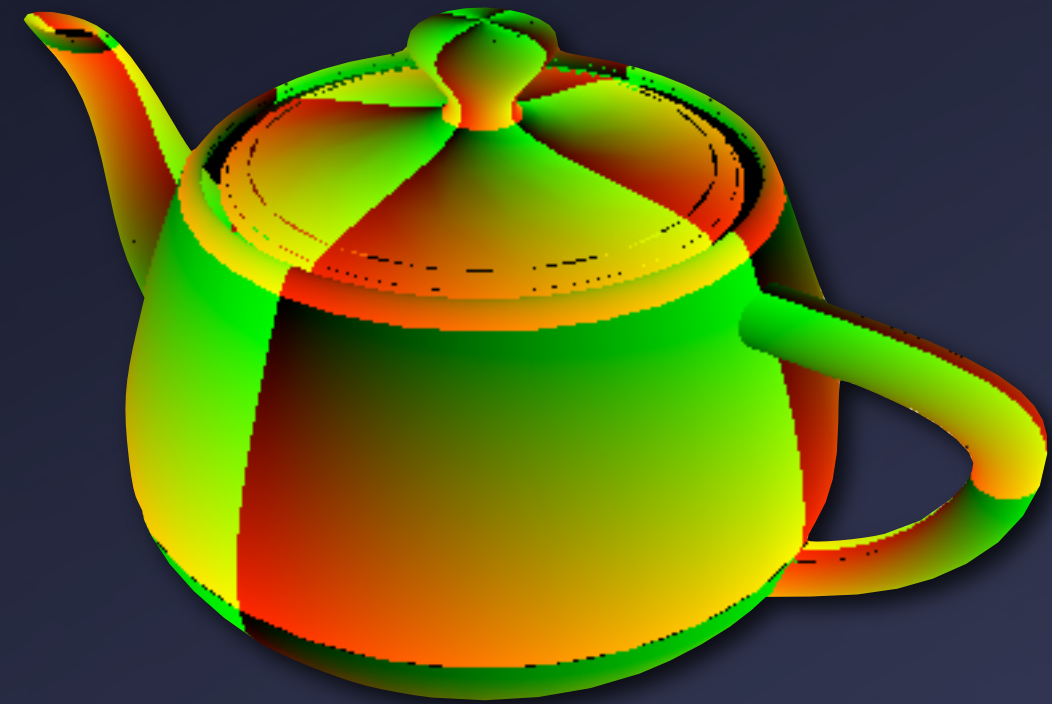


ID Processing

Our Hybrid Approach



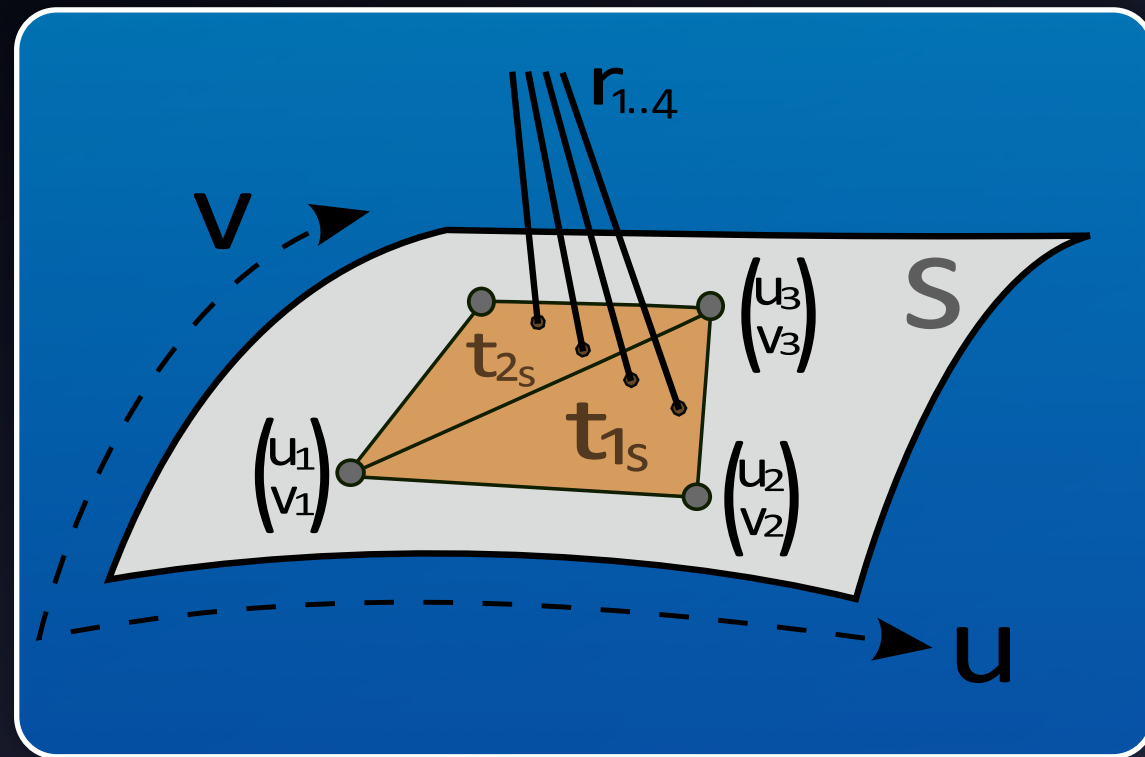
ID Processing



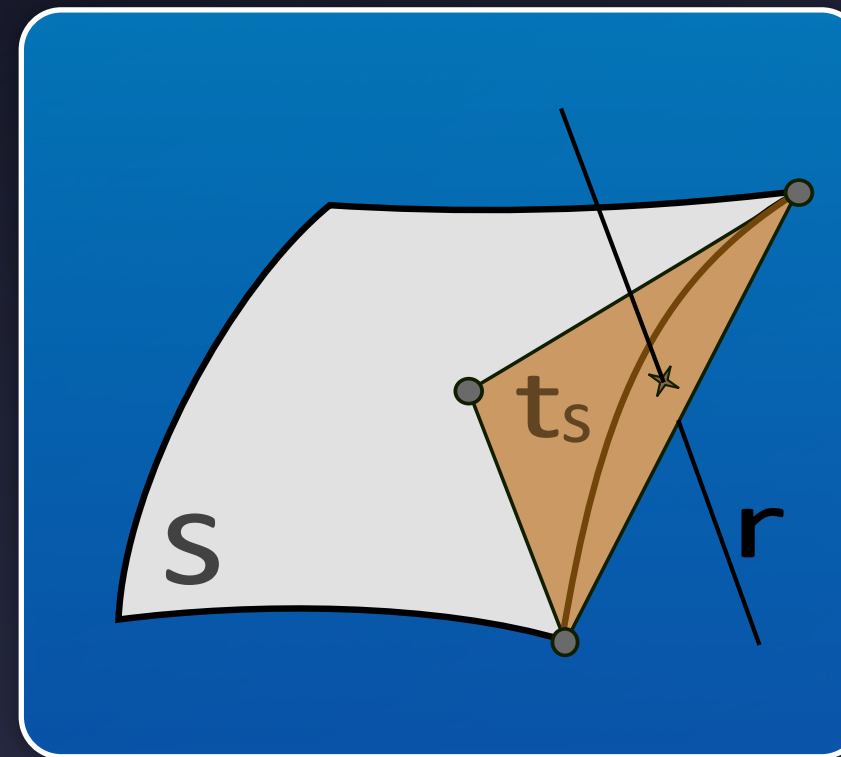
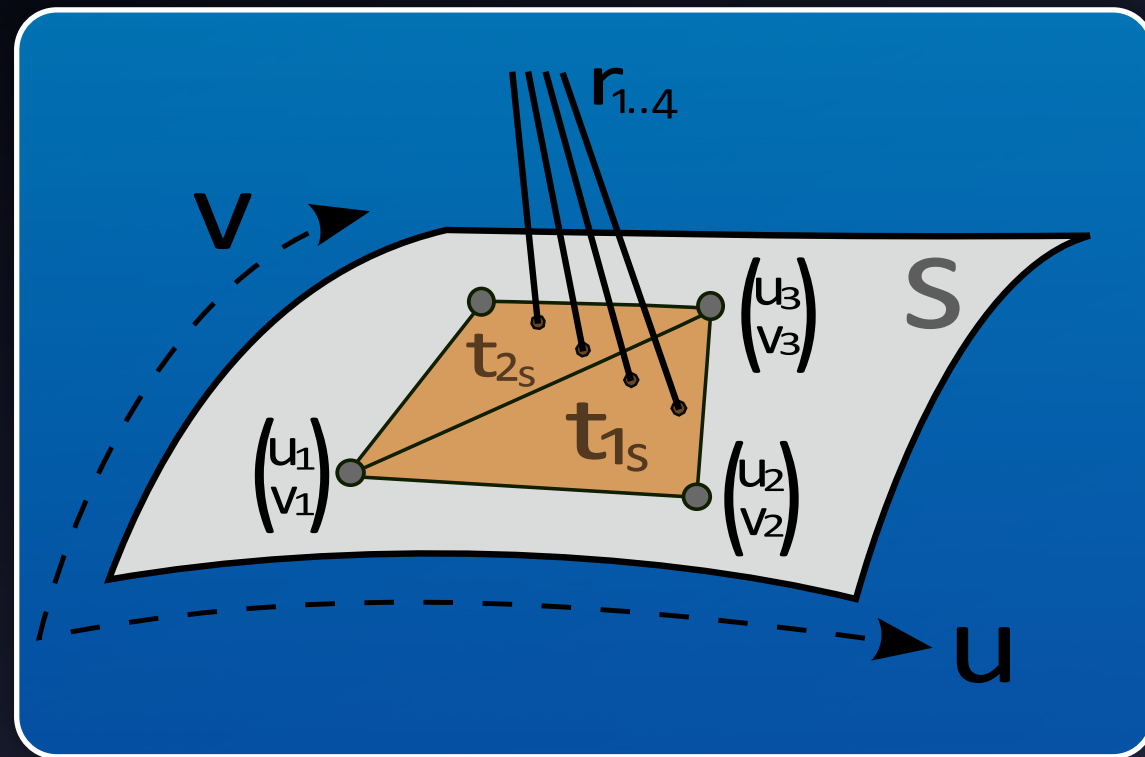
UV Processing

Default and Special Cases

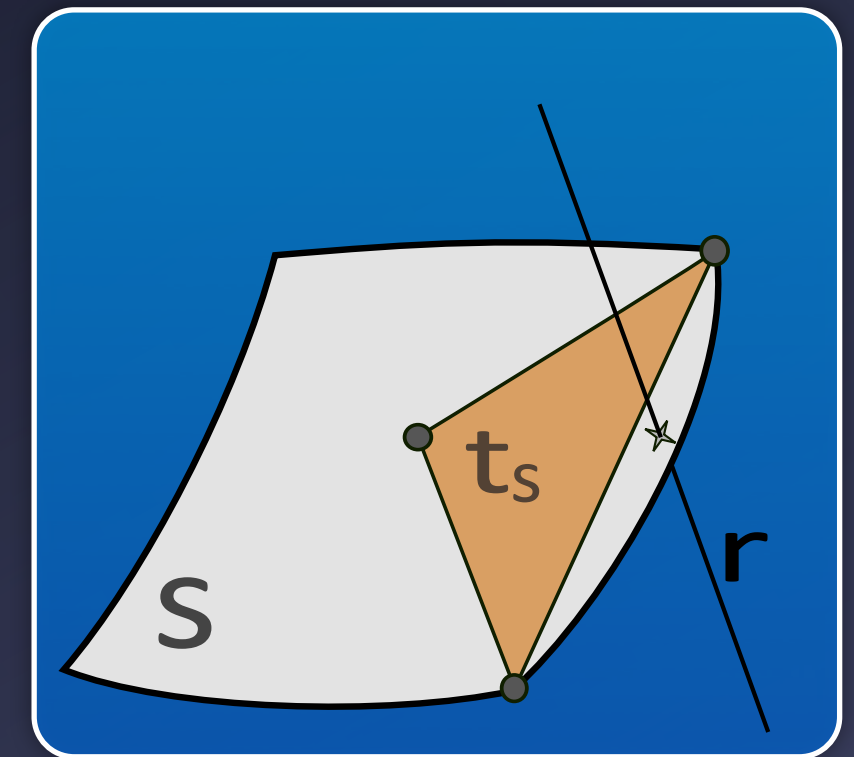
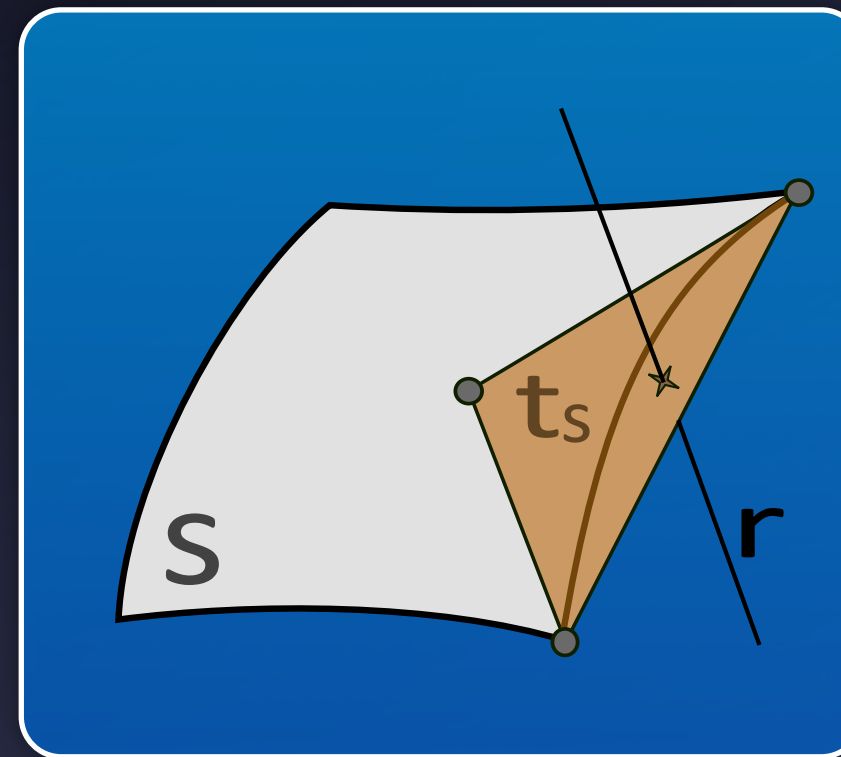
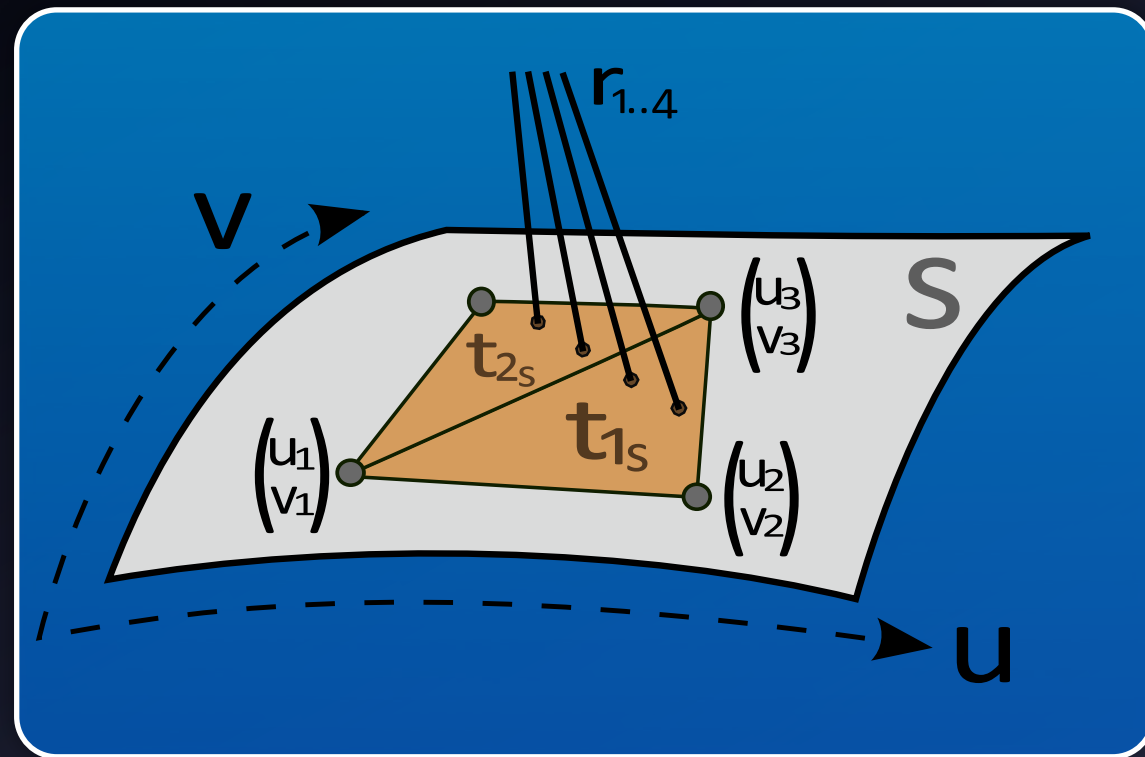
Default and Special Cases



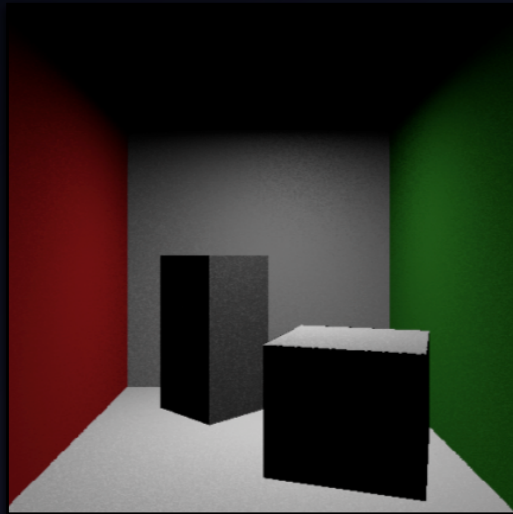
Default and Special Cases



Default and Special Cases



Results



18
576

90
170712

1212
1389582



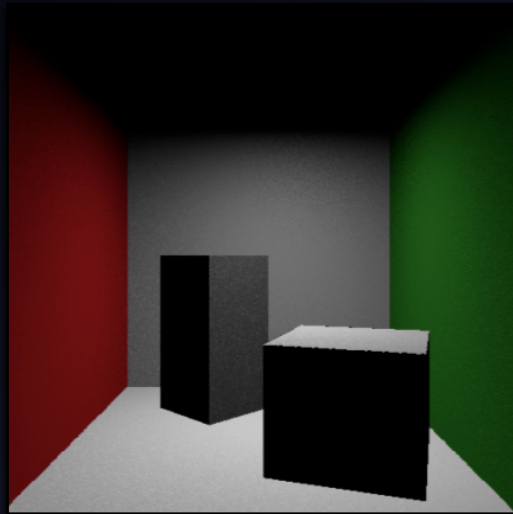
1

3.1

3.3

2.1

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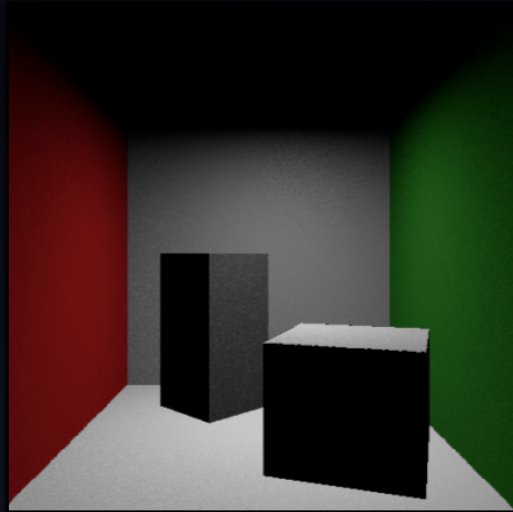
8

22.2

22.4

15.1

Results



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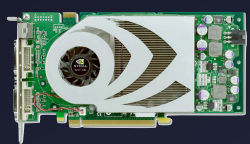


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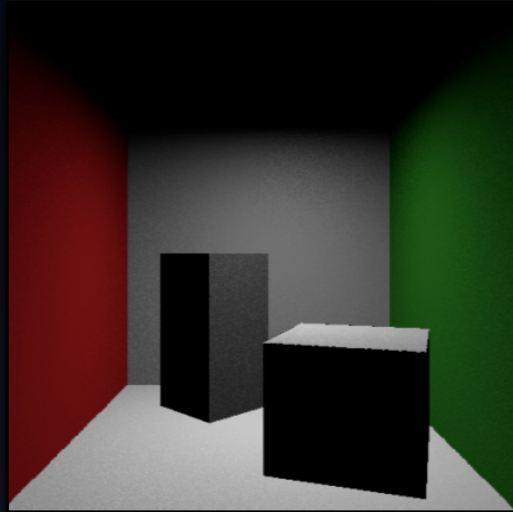
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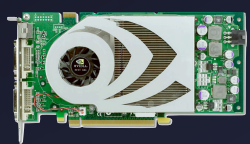


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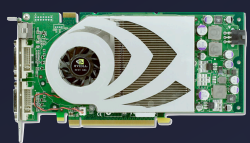


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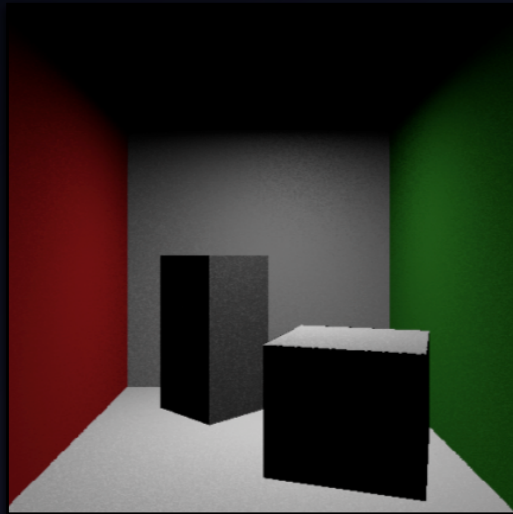
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14.3

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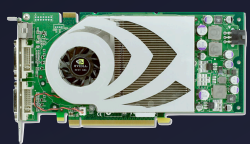


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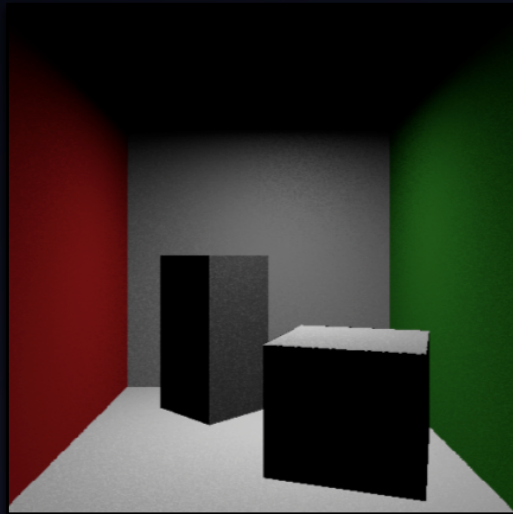
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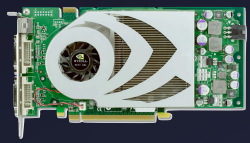


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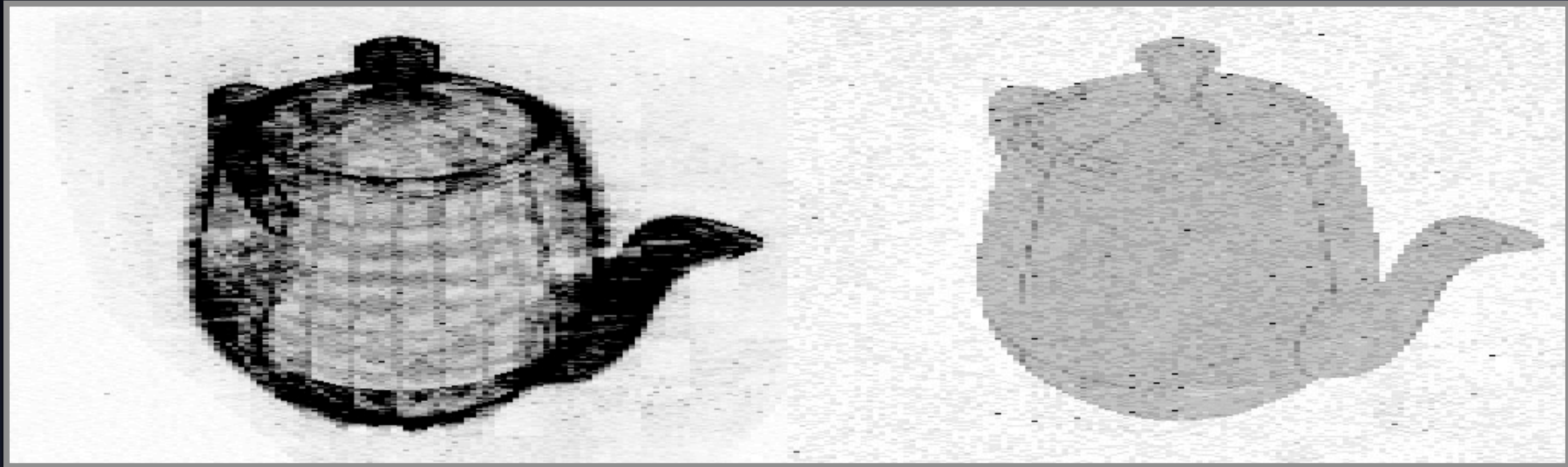
8

25.5

30.8

14.3

Results



default tracing

hybrid tracing

Conclusion & Future Work

- ✦ Simple technique to speed up NURBS ray tracing for primary rays on moderate scenes
- ✦ Improve OpenGL RenderTimes
- ✦ Evaluate time shifted rendering
- ✦ (Port NURBS intersection test to the GPU)



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Any Questions?



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