BASICS OF OPTIMIZATION

Before jumping to GPU, take some baby steps

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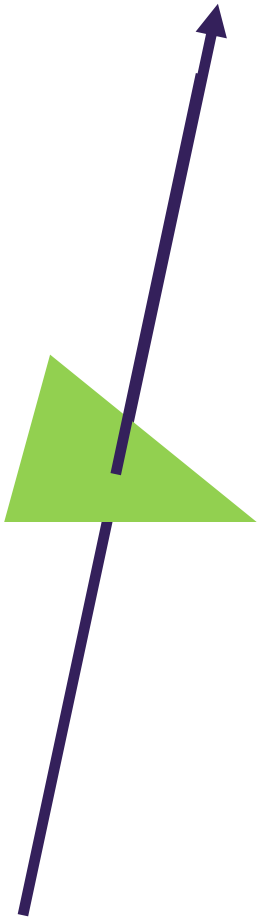

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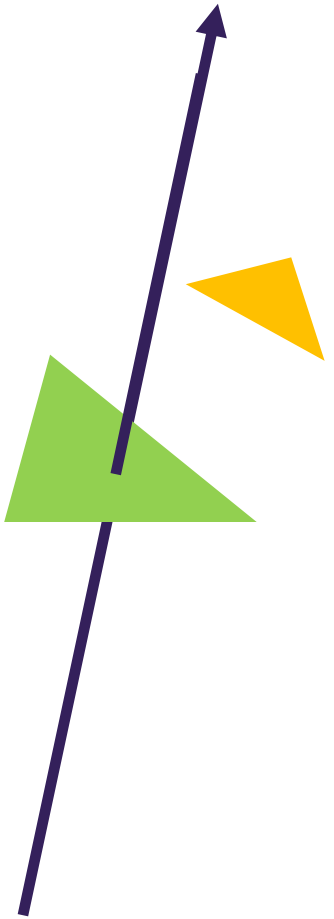

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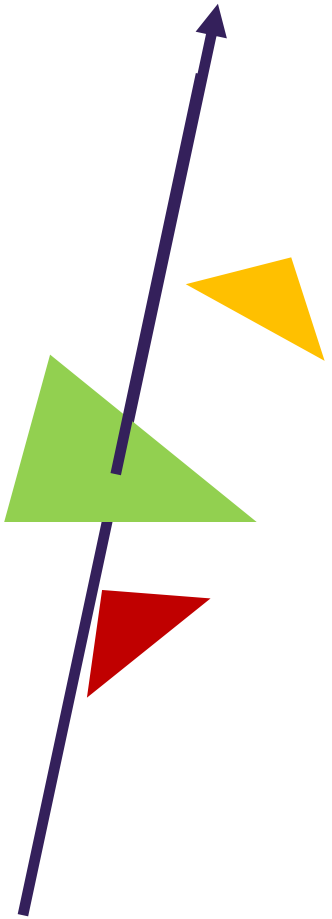

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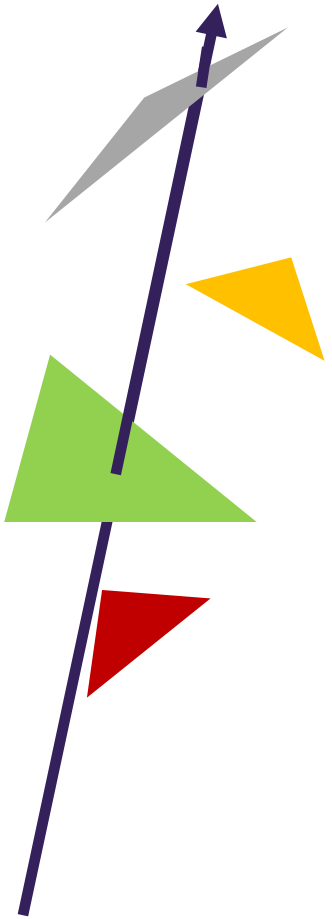

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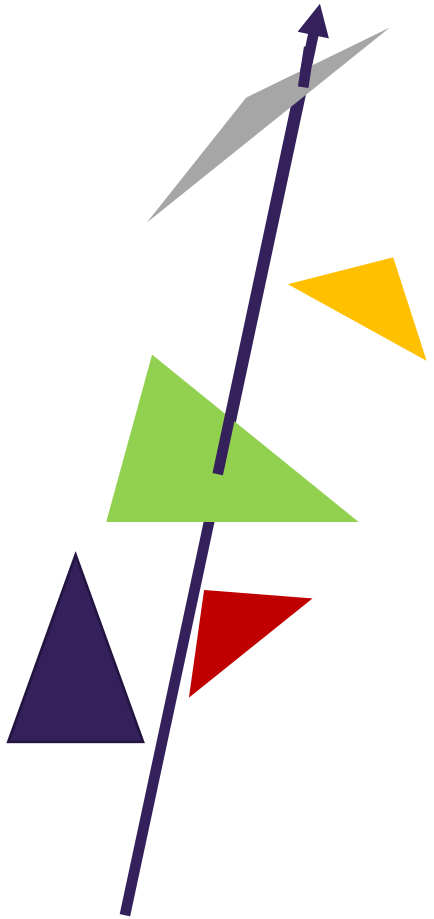

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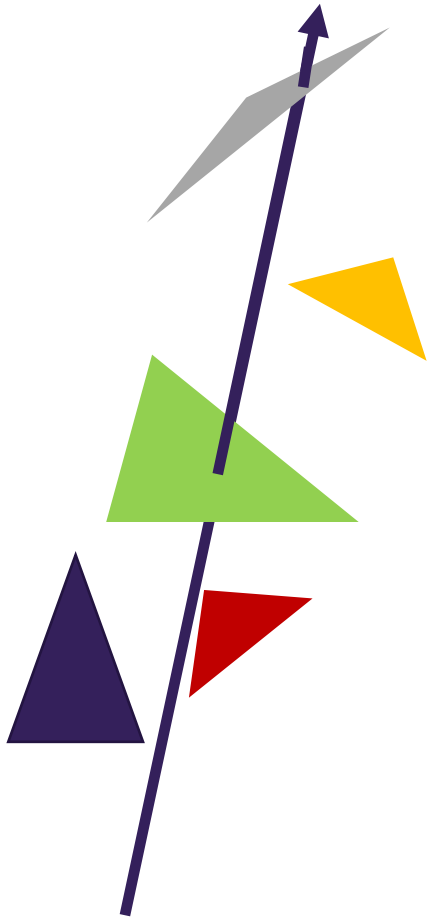

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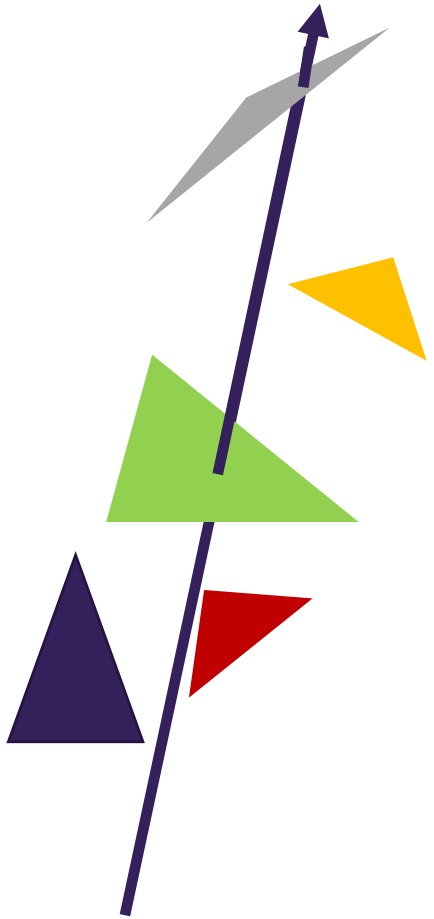

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    - Very expensive…
    - Every ray could test, 1 million (or more) triangles

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- Conclusion: ***Don't test every triangle!***

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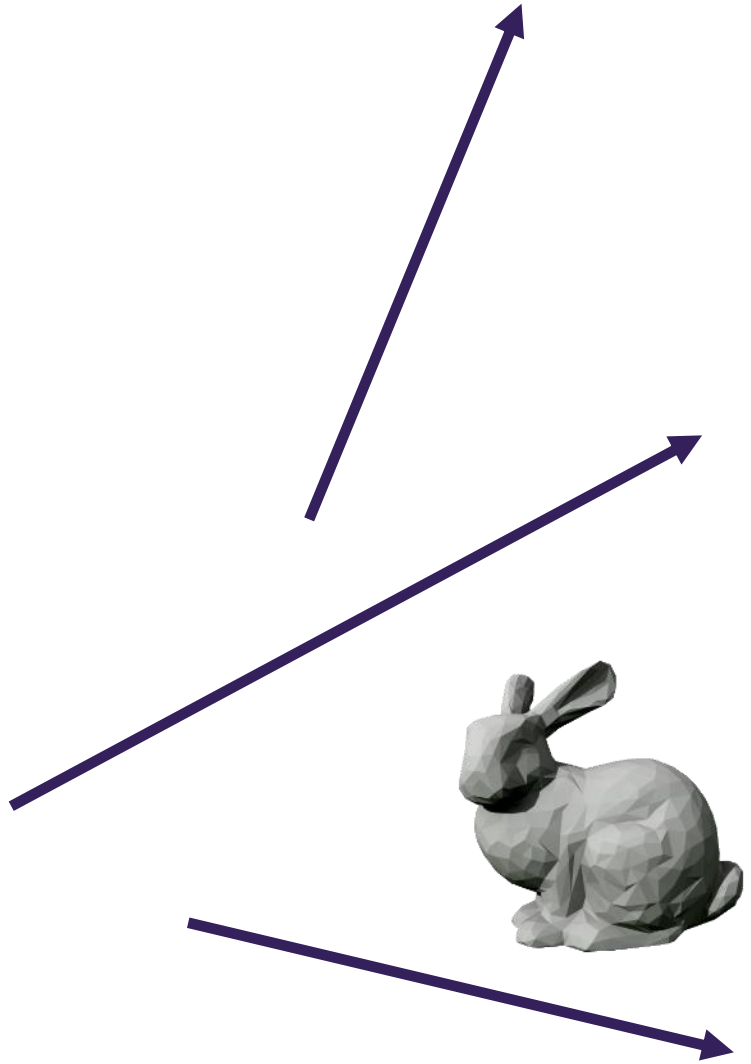

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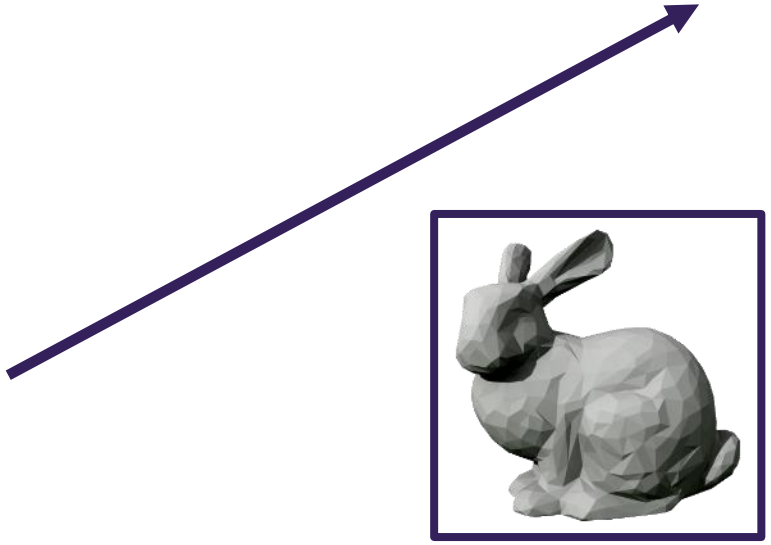

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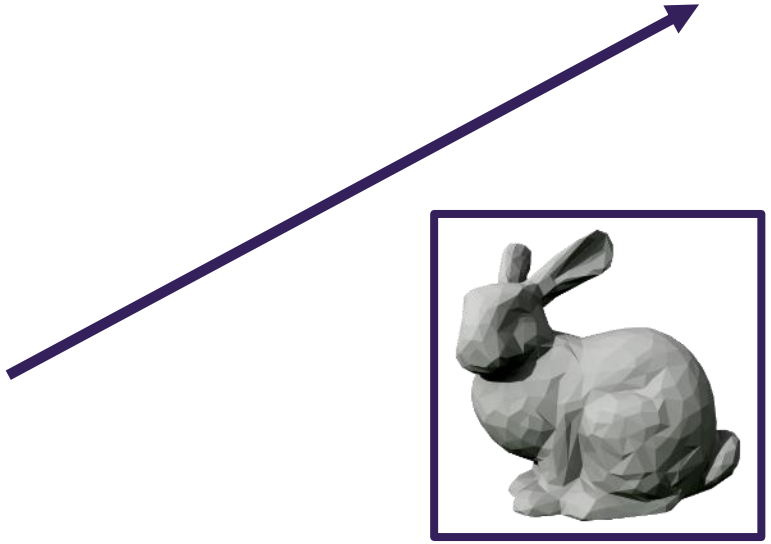
  - Most rays avoid testing thousands of triangles
  - But, extra box test when hit bunny



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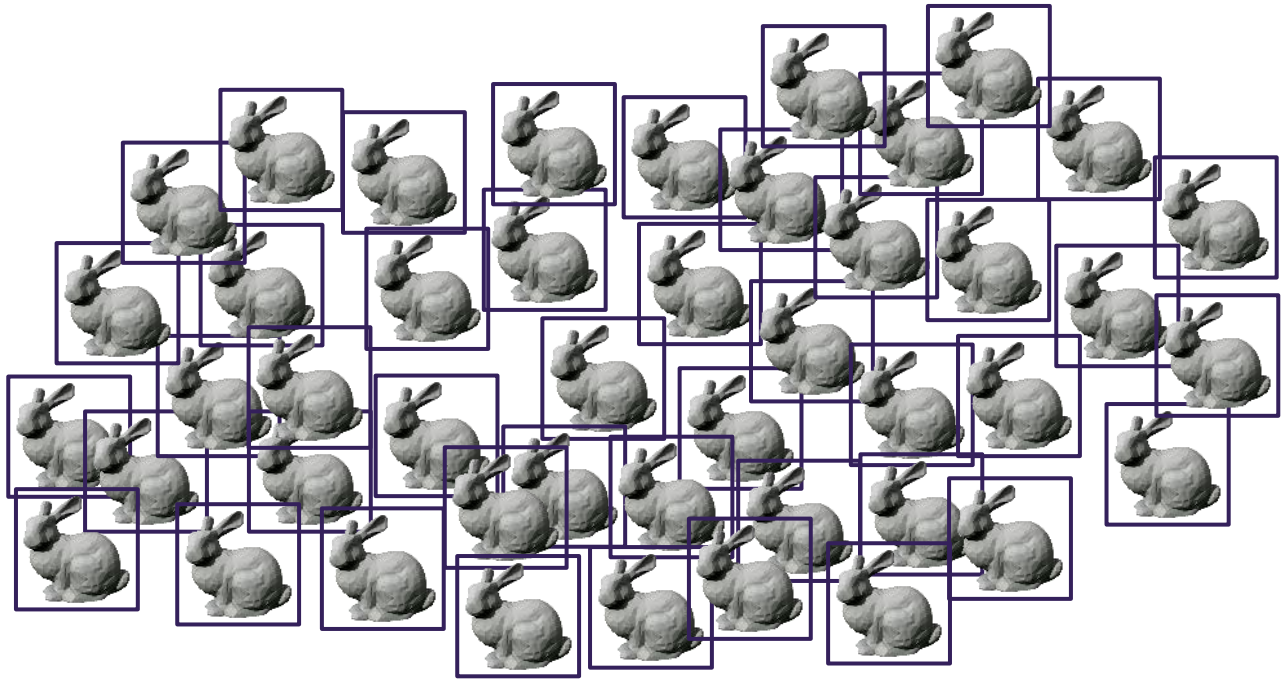

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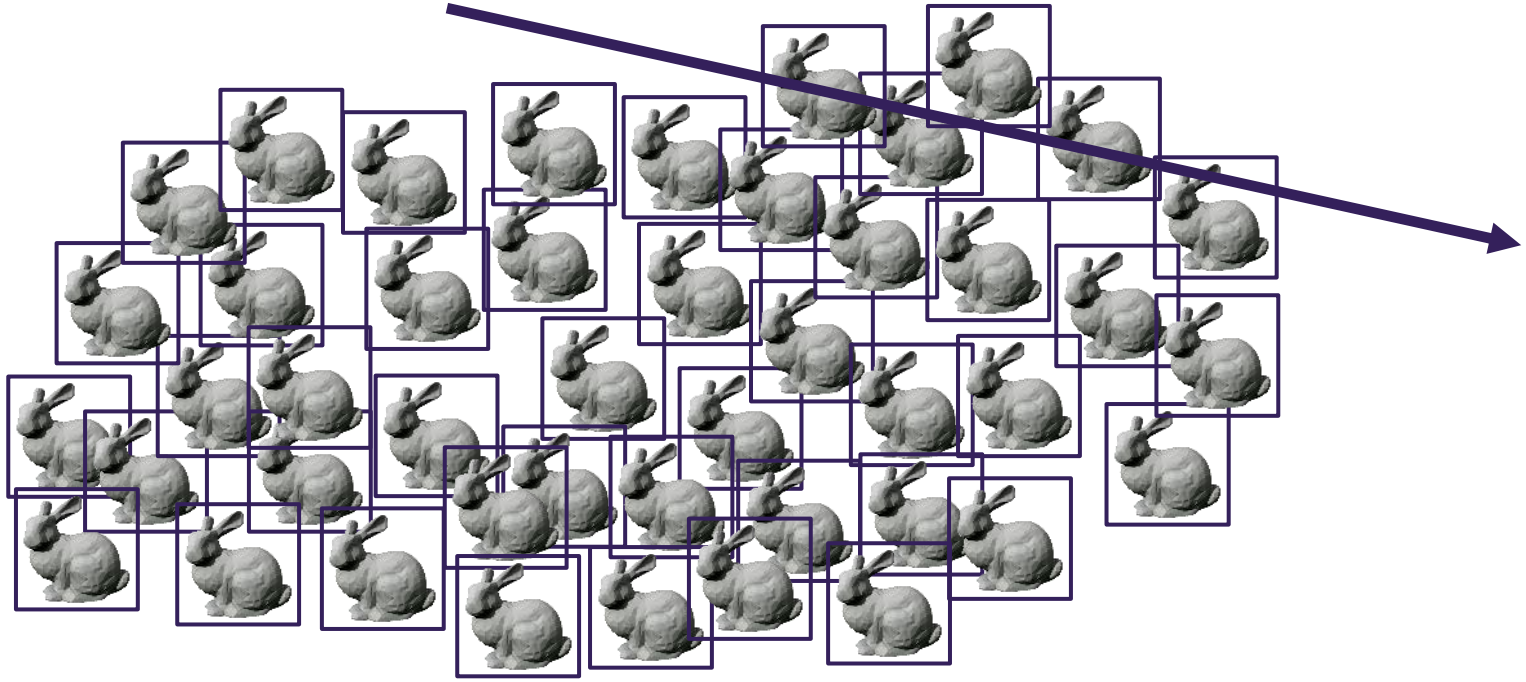

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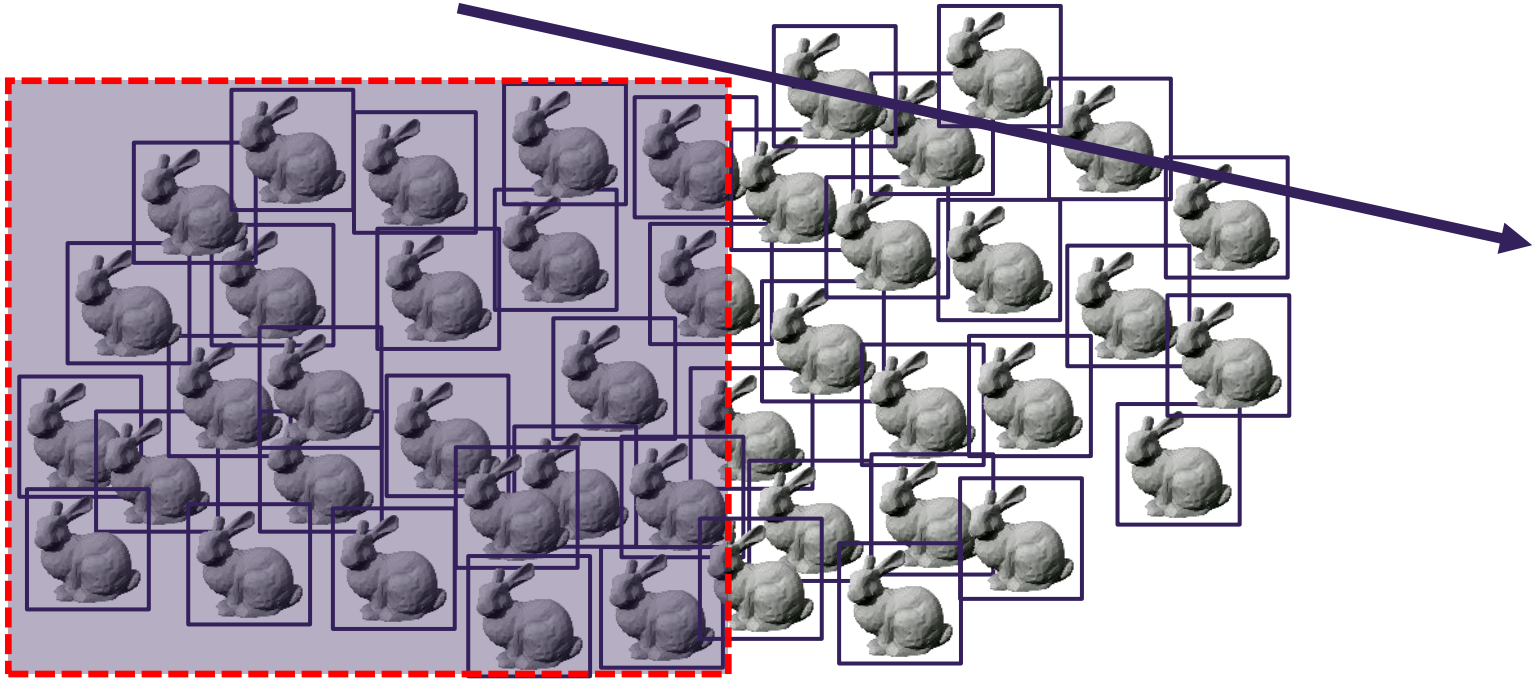

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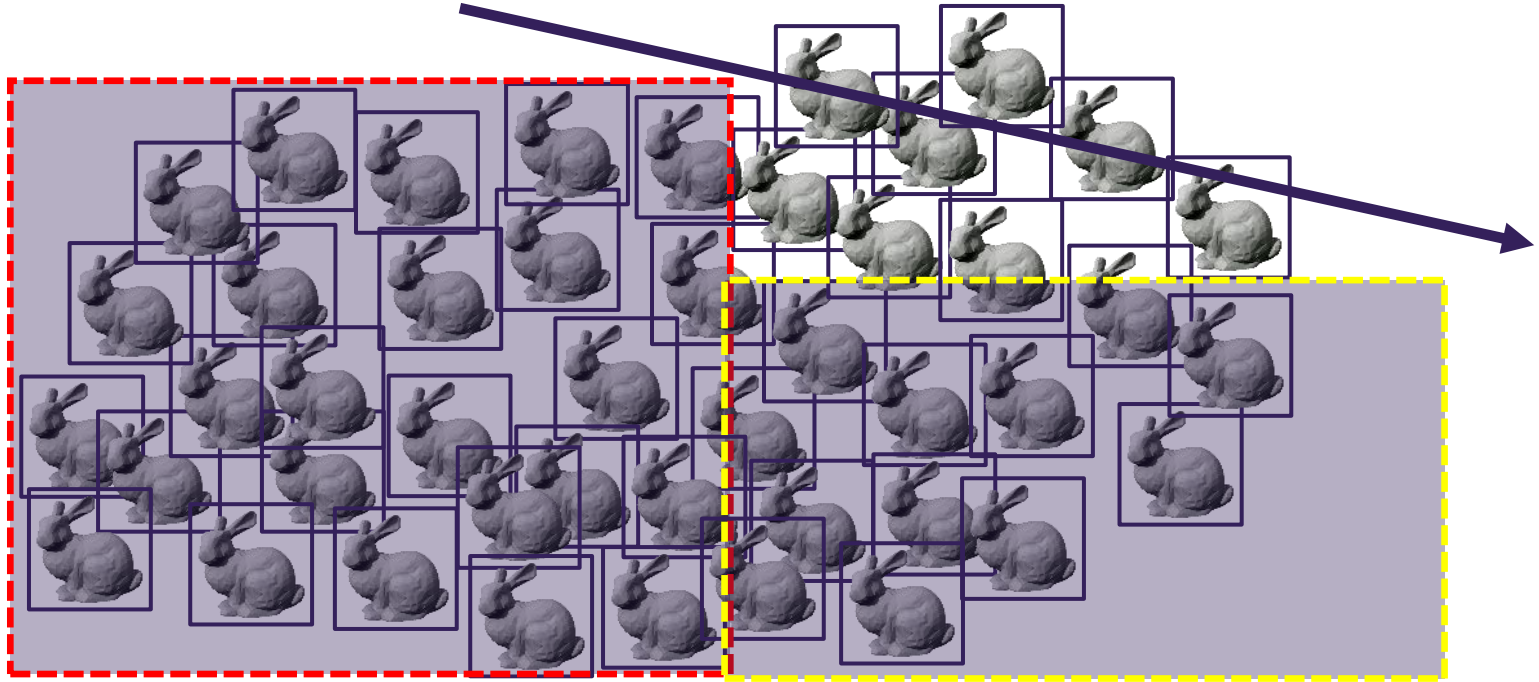

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- When using a principled tree build
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- With a binary tree, 1 million ray-triangle tests becomes:
  - Around 20 ray-box tests
  - A few ray-triangle tests in leaf nodes

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- When starting real-time ray tracing, best bet:
  - Use someone else’s code
  - Quality of your BVH easily affects performance by 2x, 3x, or >10x
    - Varies per scene!
  - Luckily most APIs will build structure