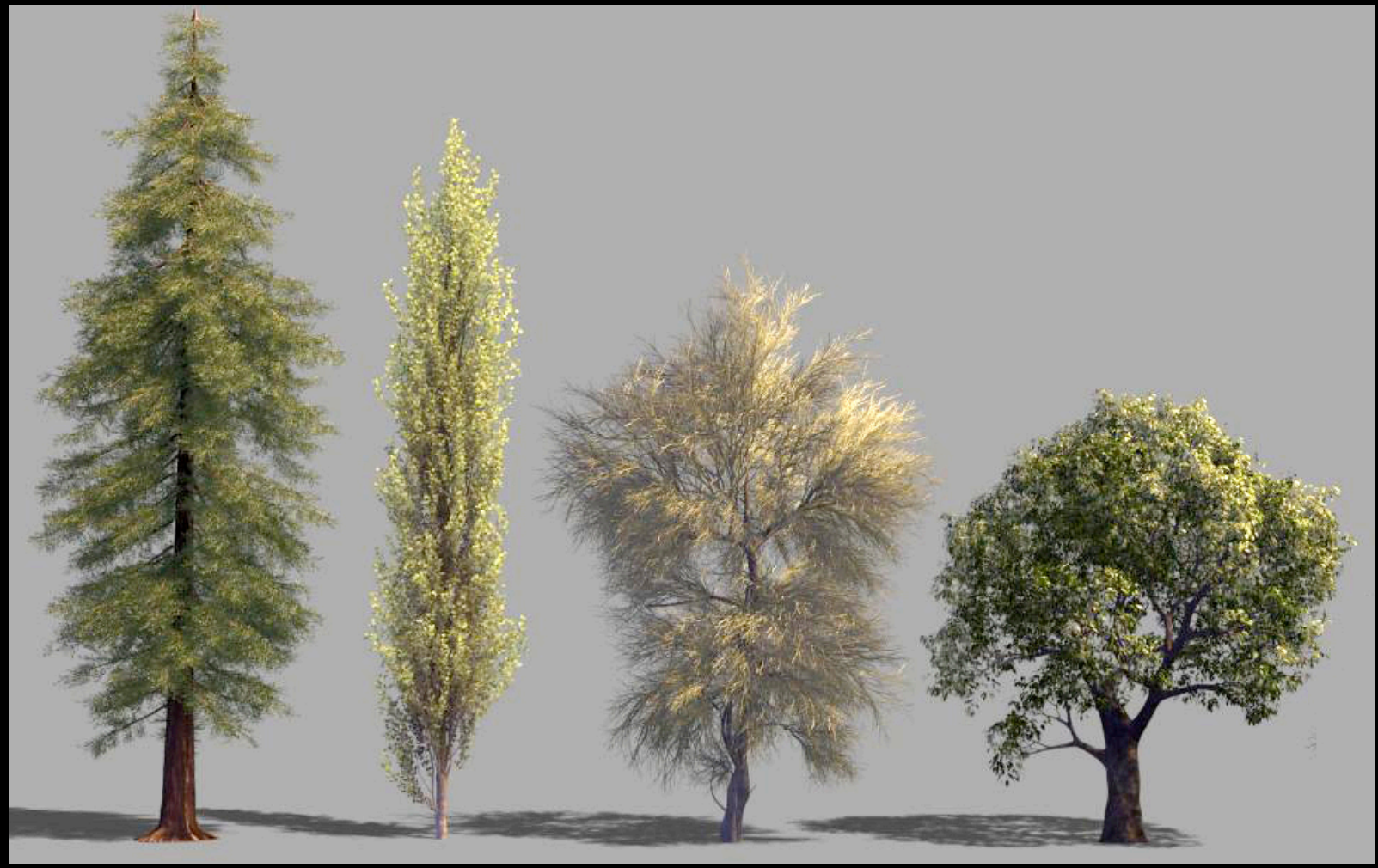
Stochastic Simplification

Rob Cook
John Halstead
Maxwell Planck
David Ryu

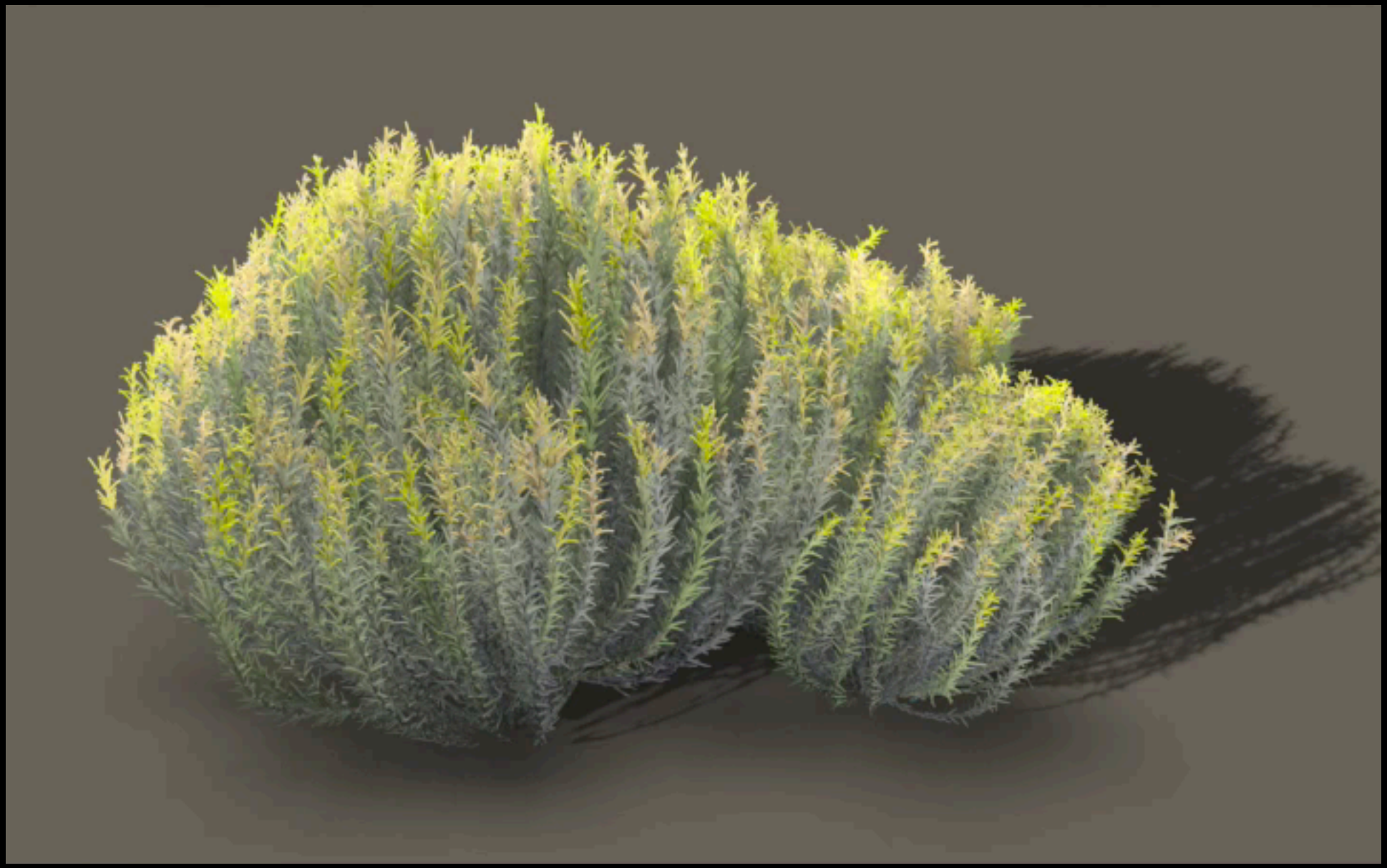
Vegetation on Disney/Pixar's Cars

Rat Fur on Disney/Pixar's RATATOUILLE

Back in June 2004 . . .



Problem Discovery



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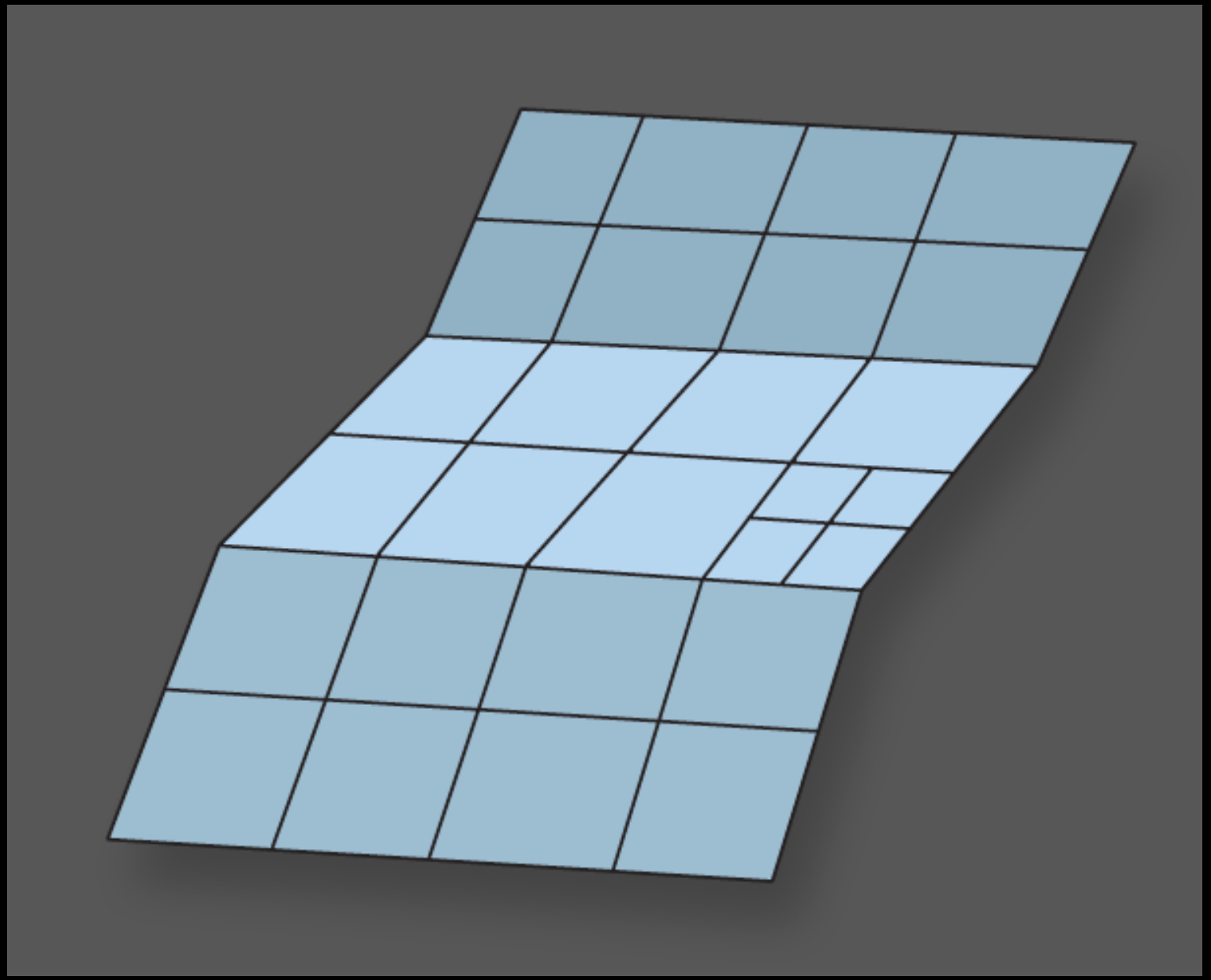
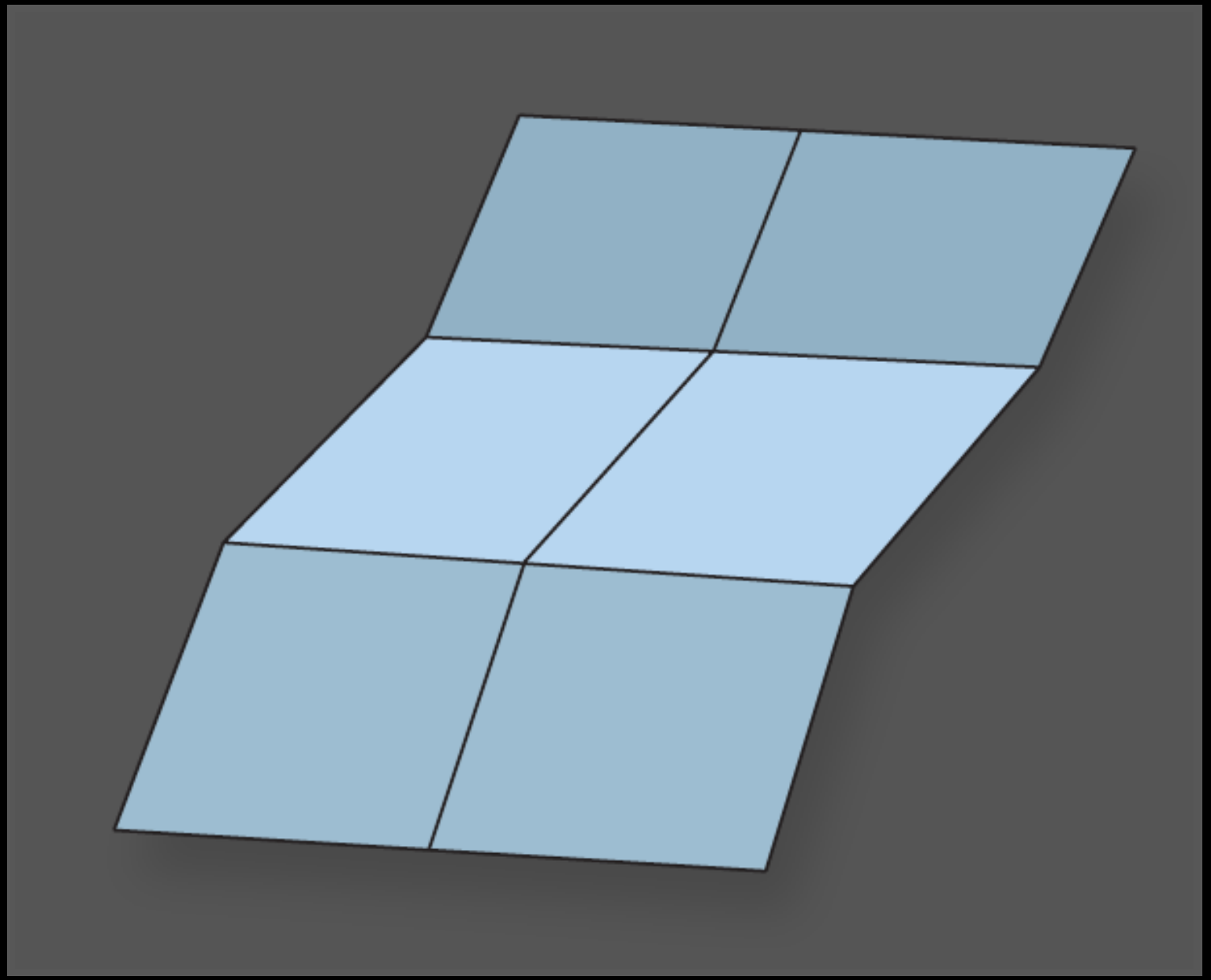


Overview of Simplification



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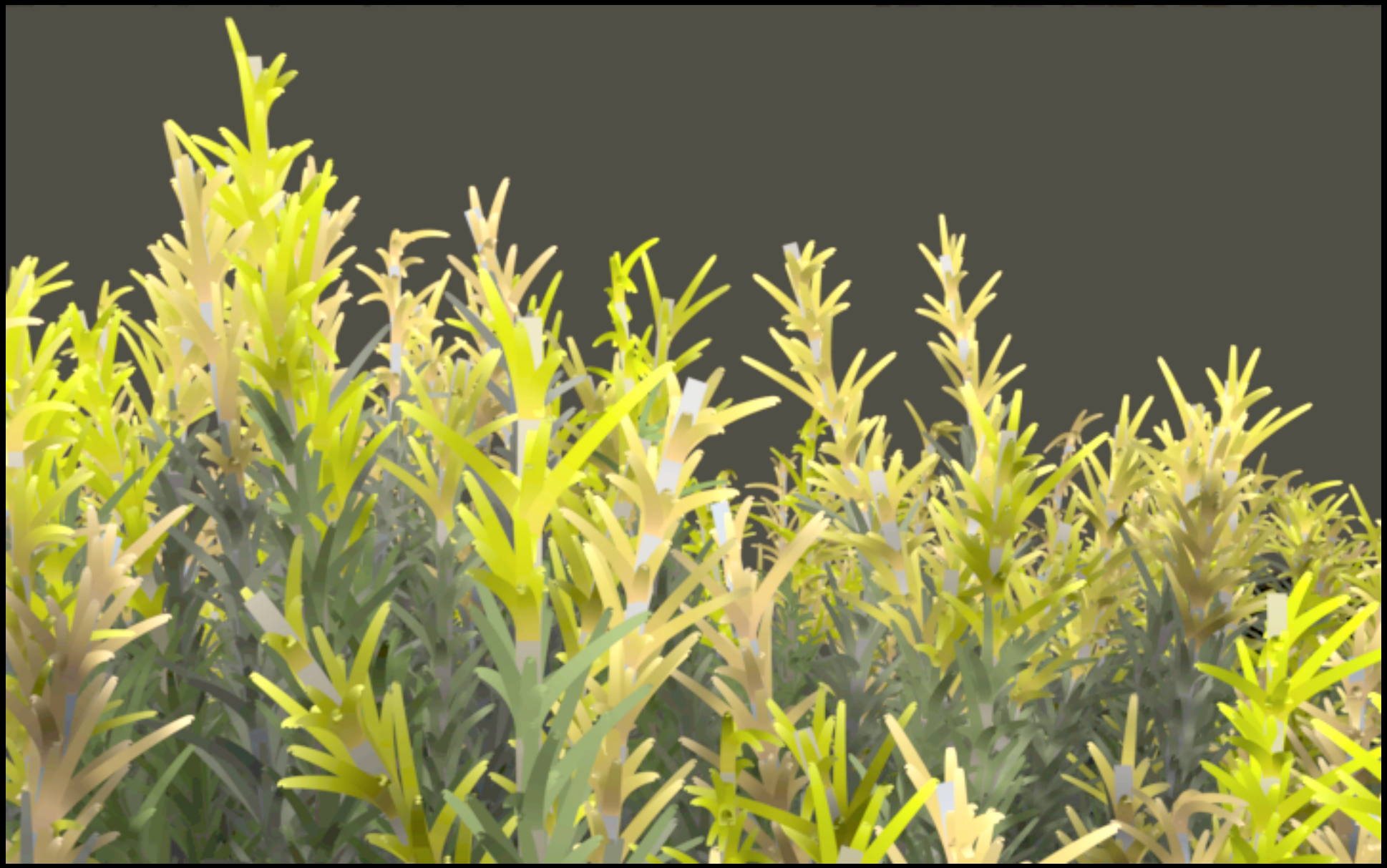

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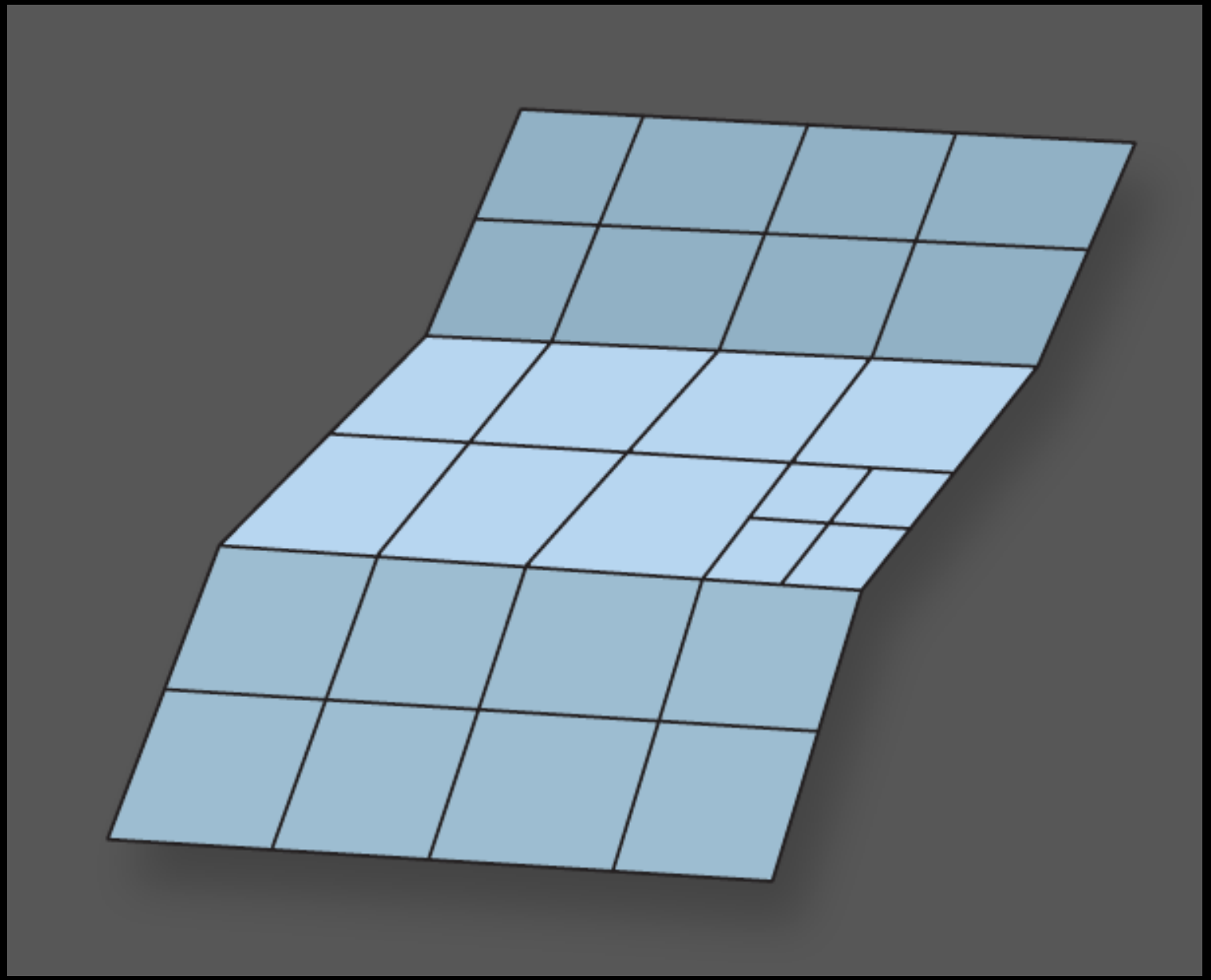

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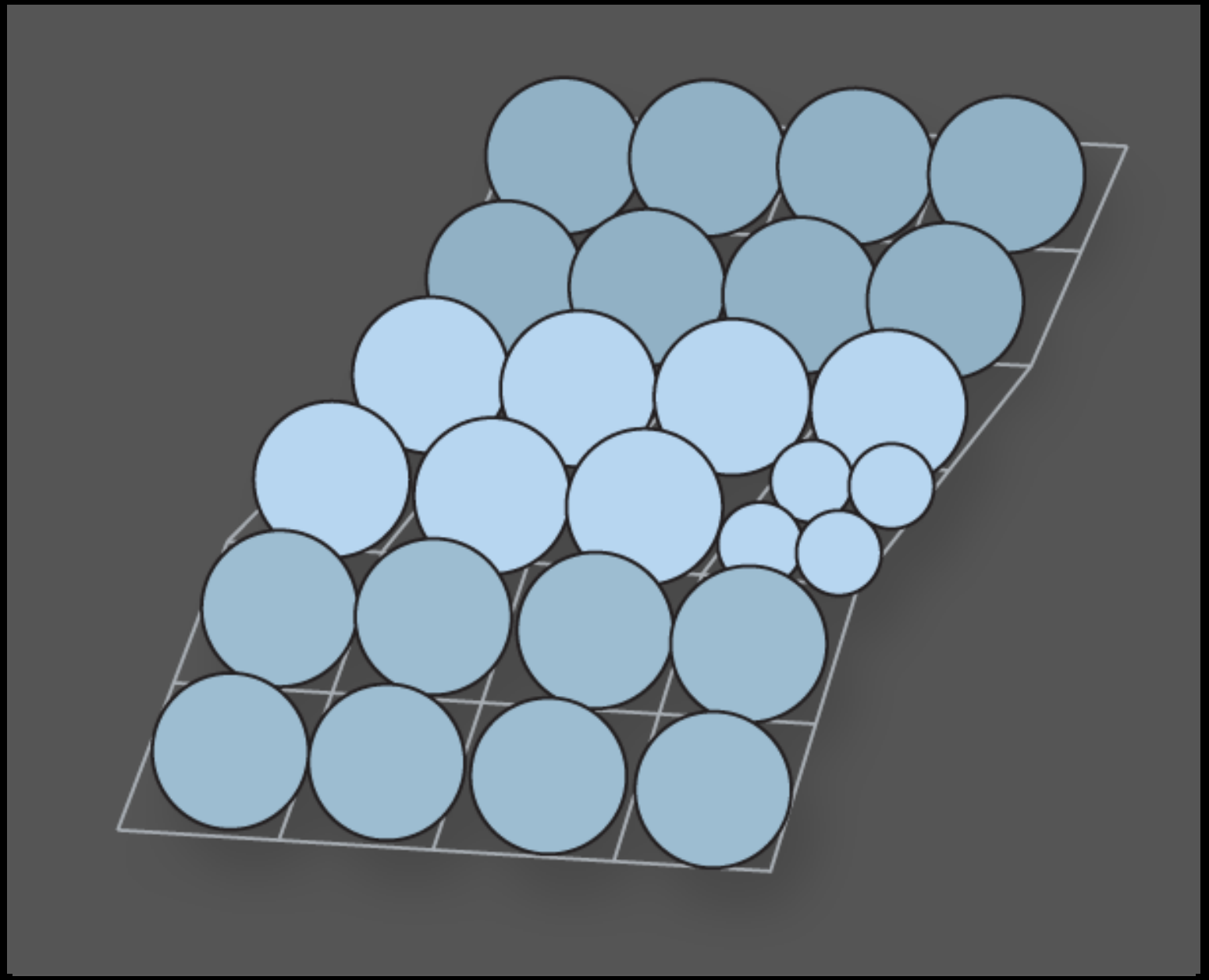

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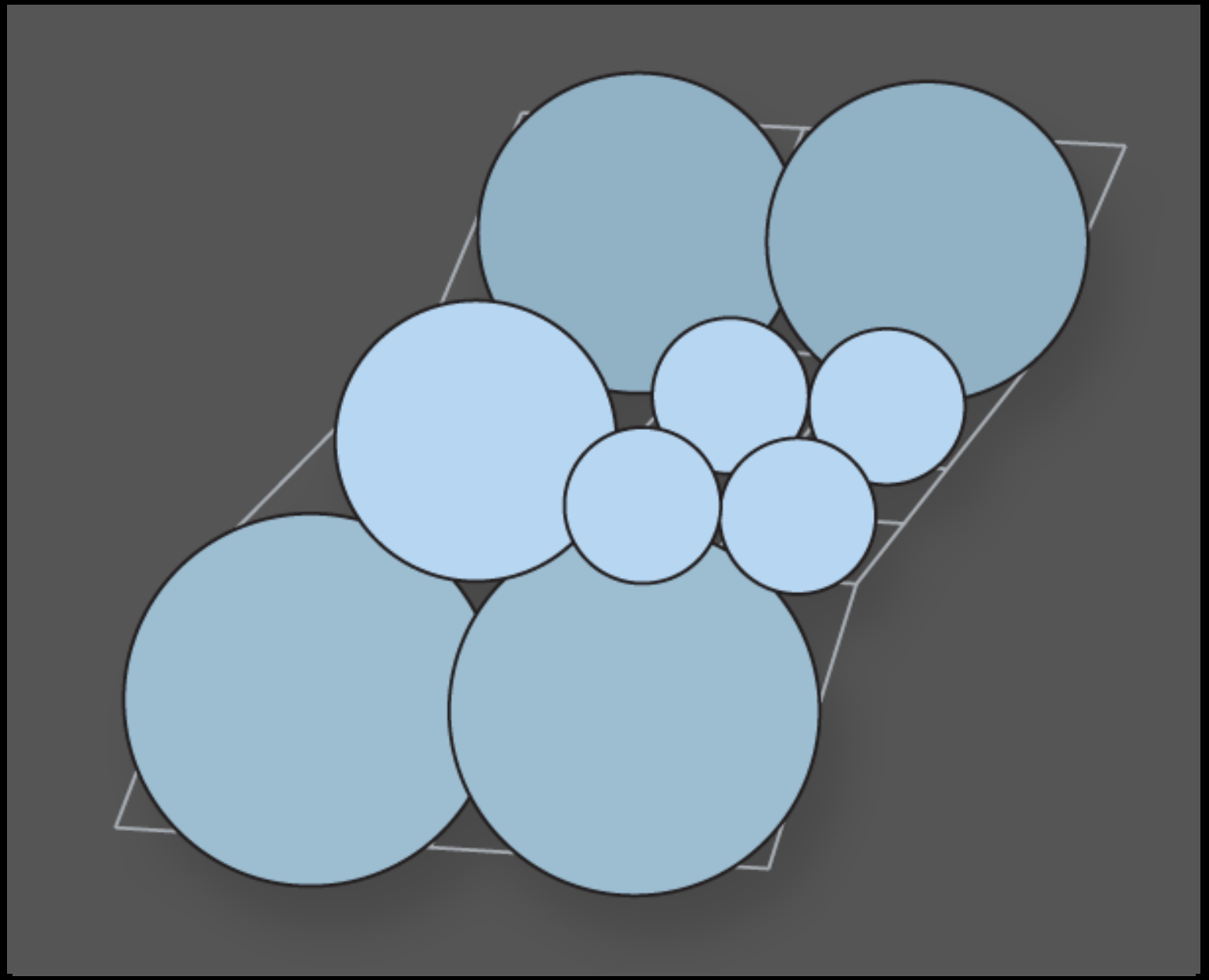

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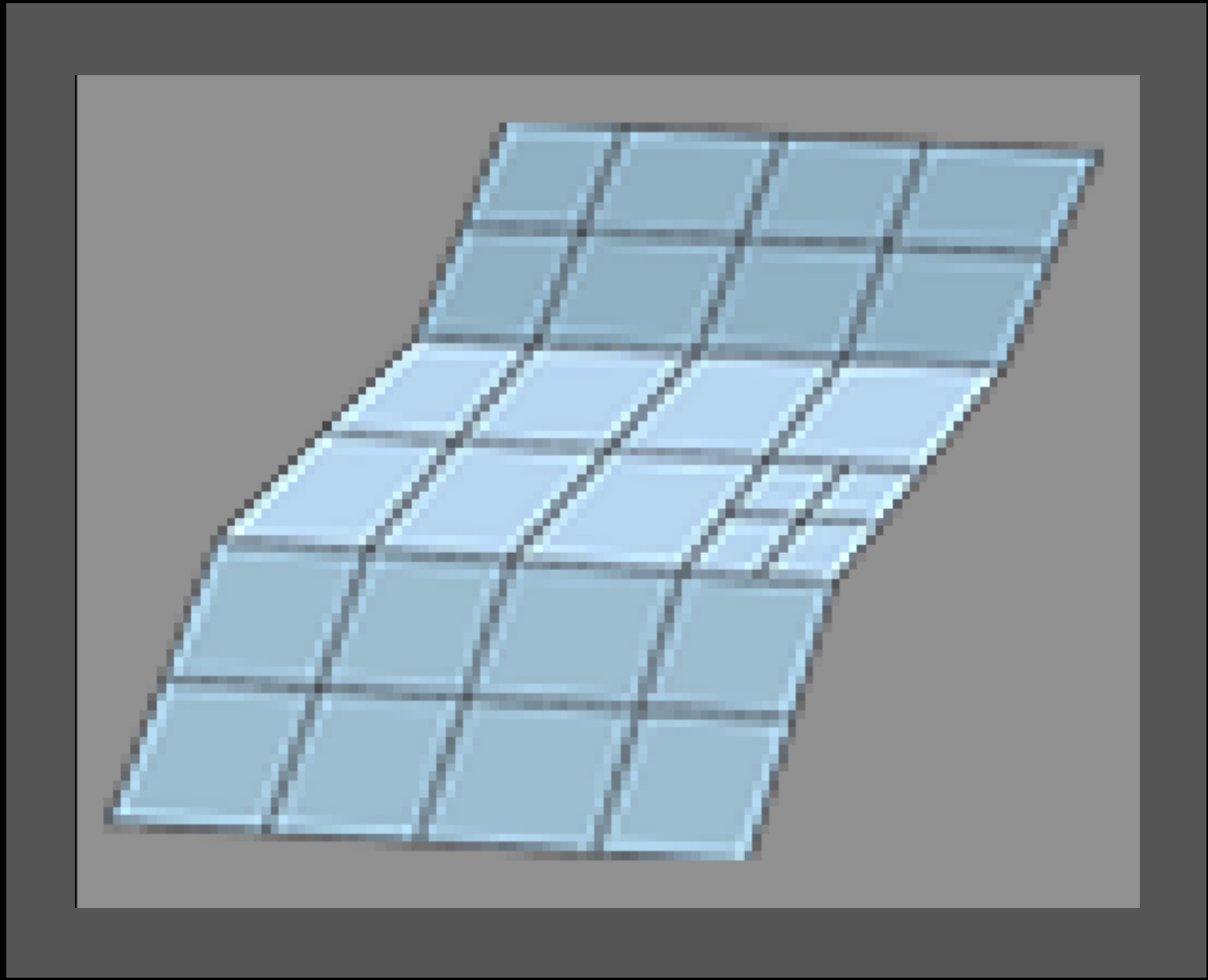


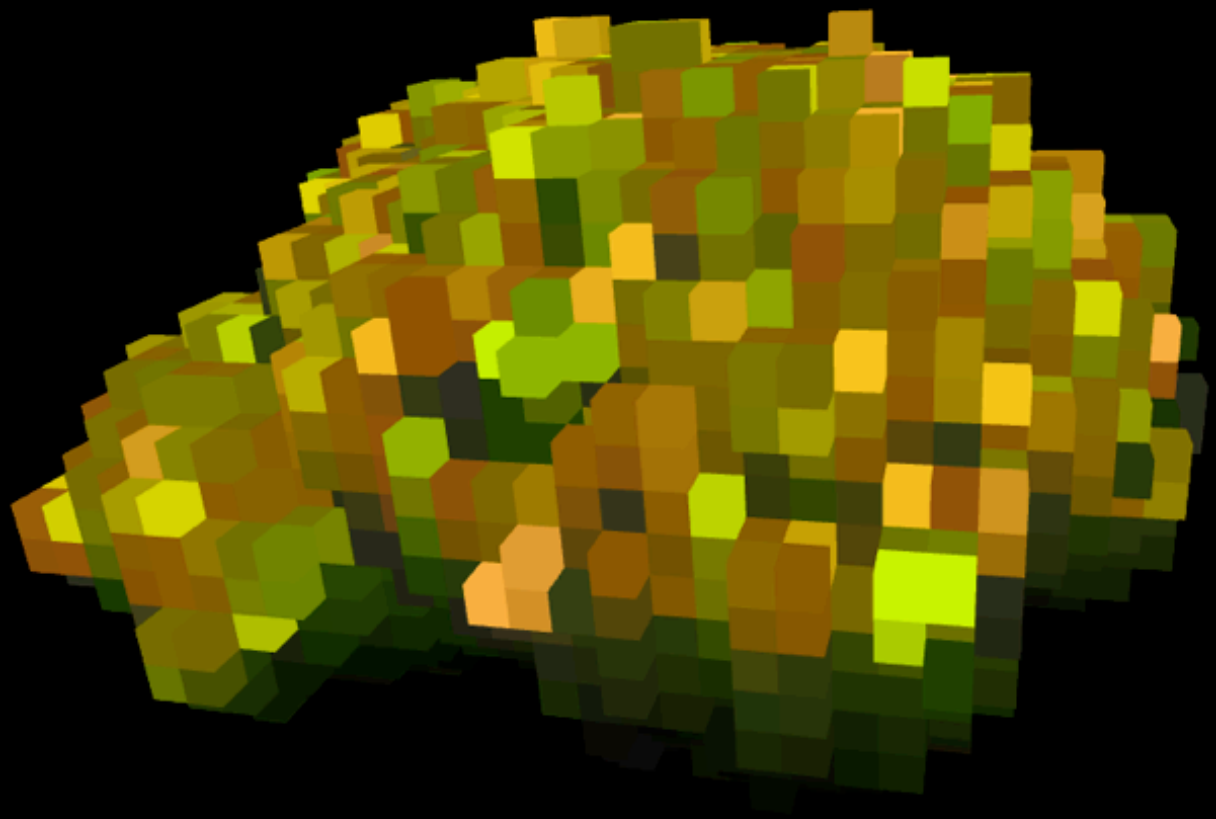
Overview of Simplification

Pixar's Cars Teaser

Problem Discovery

Pixar's Cars Teaser

Problem Discovery



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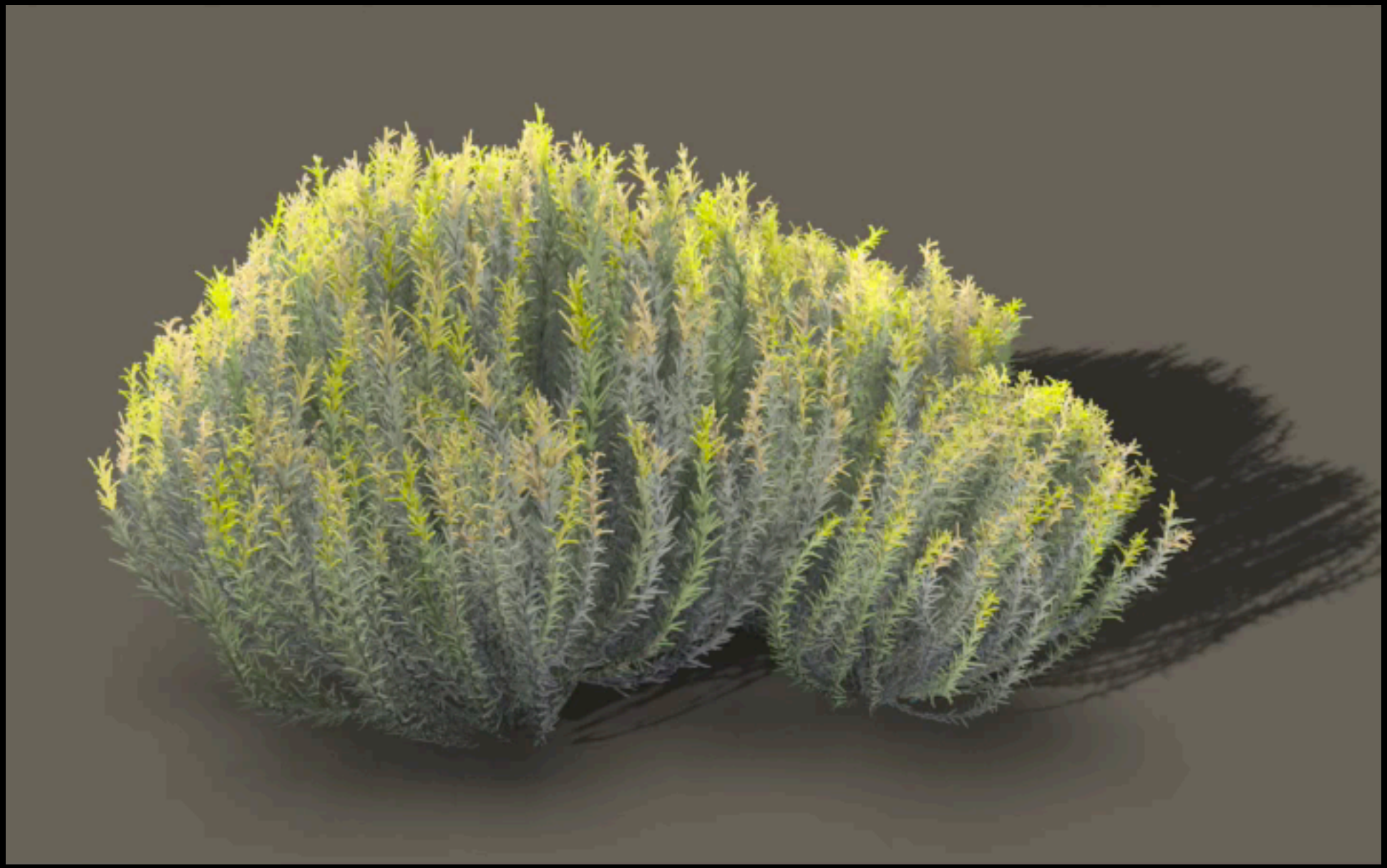


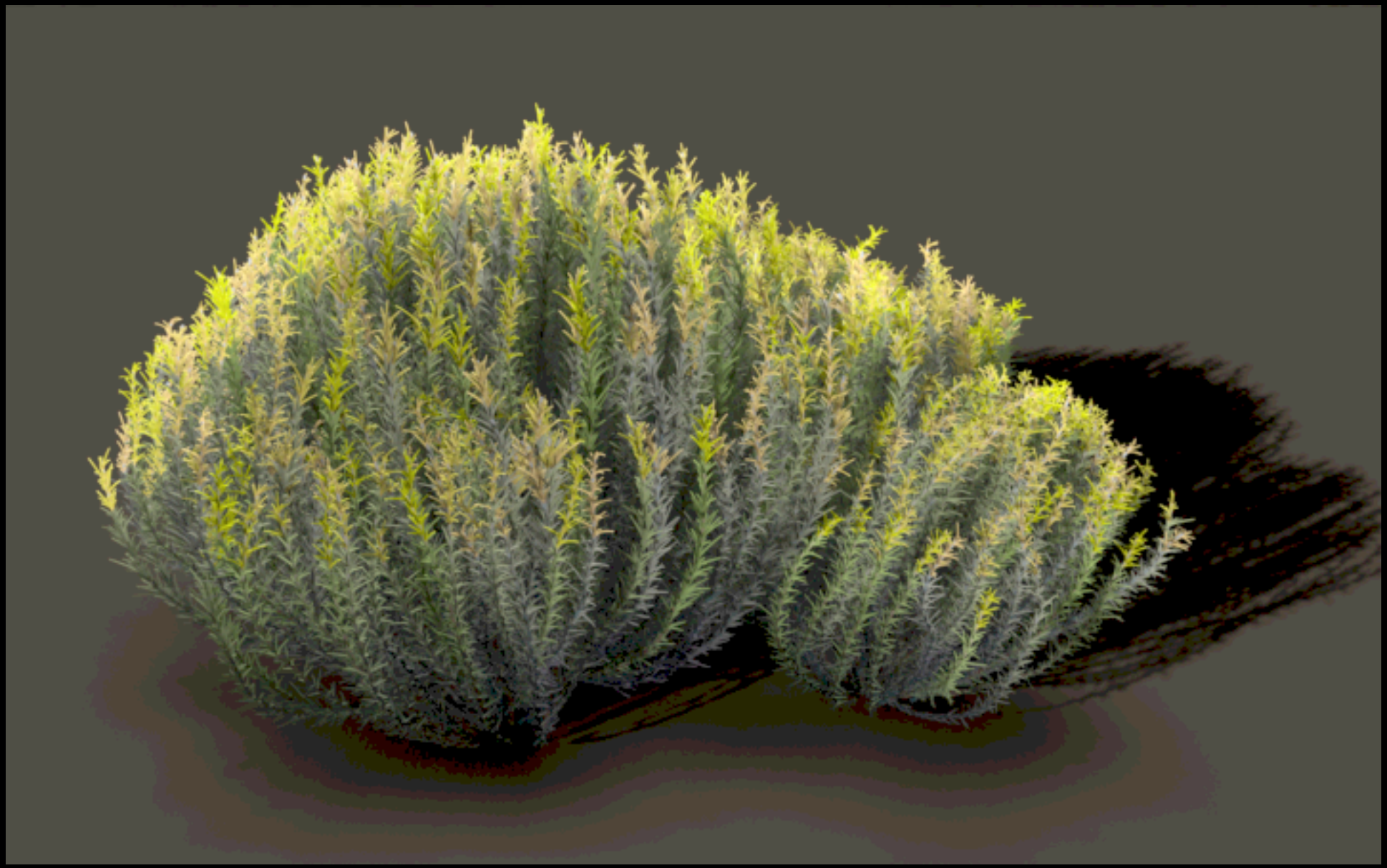
Overview of Simplification

Solution Requirements

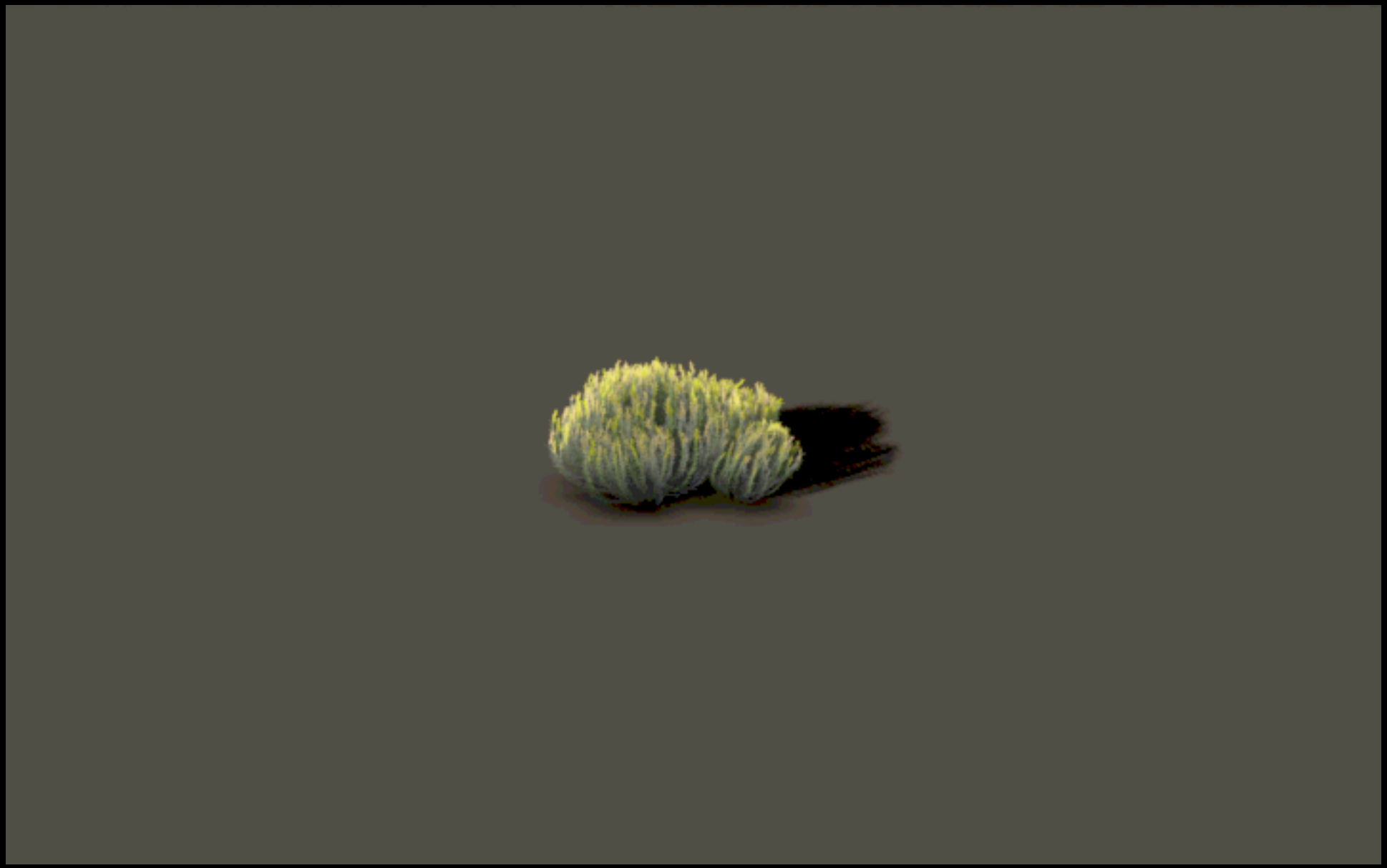
Automatic

Solution Requirements

Animate-able



Do you really need that much detail?



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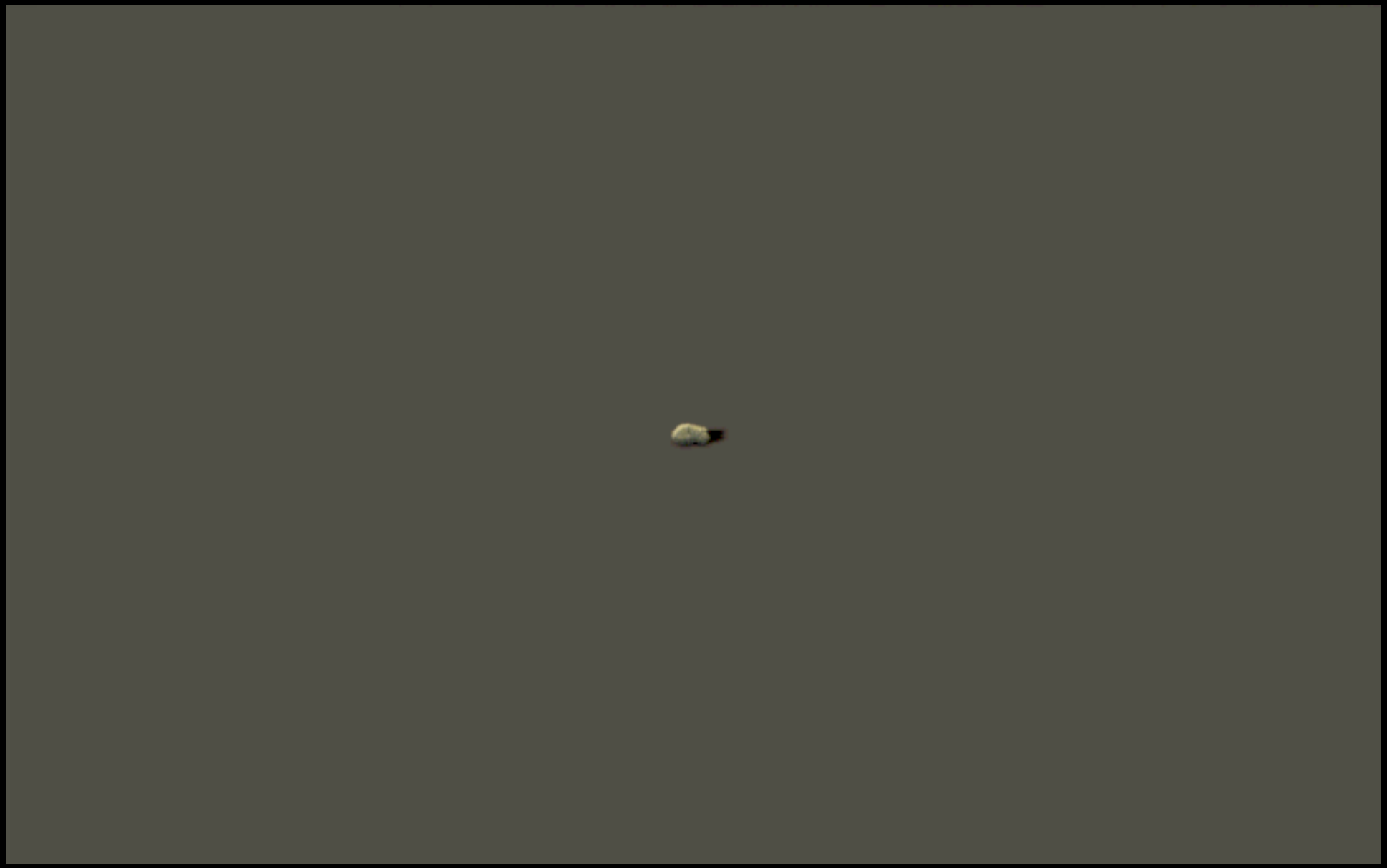
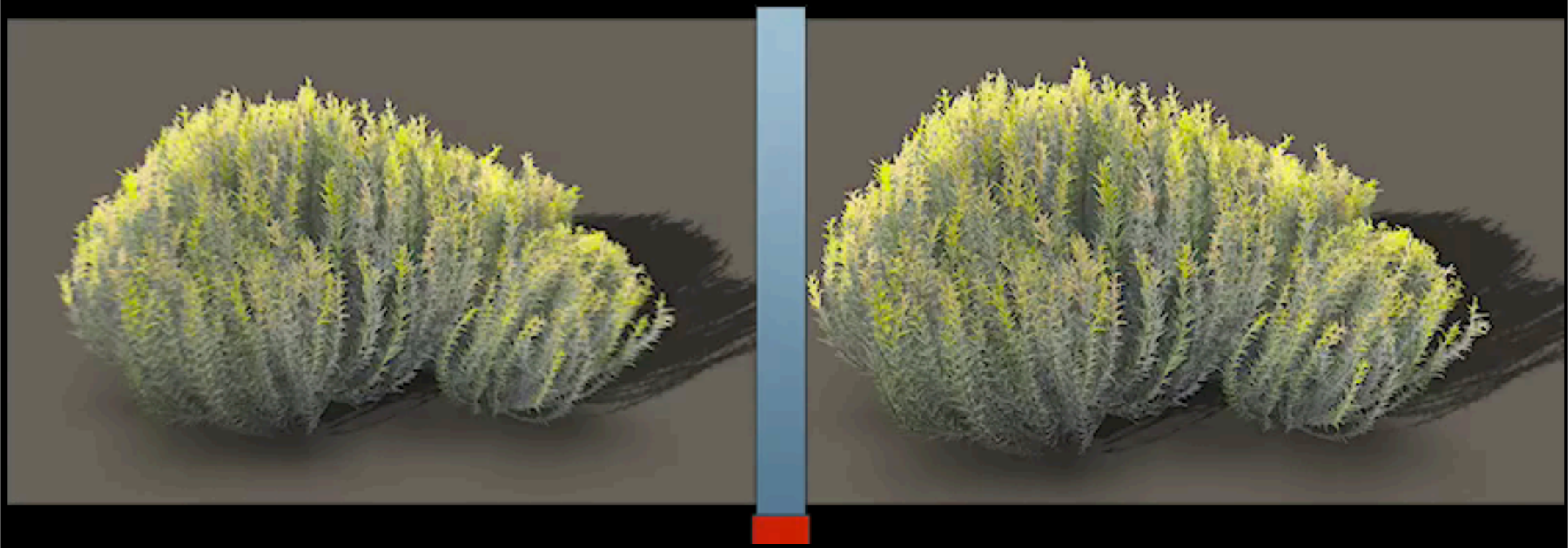
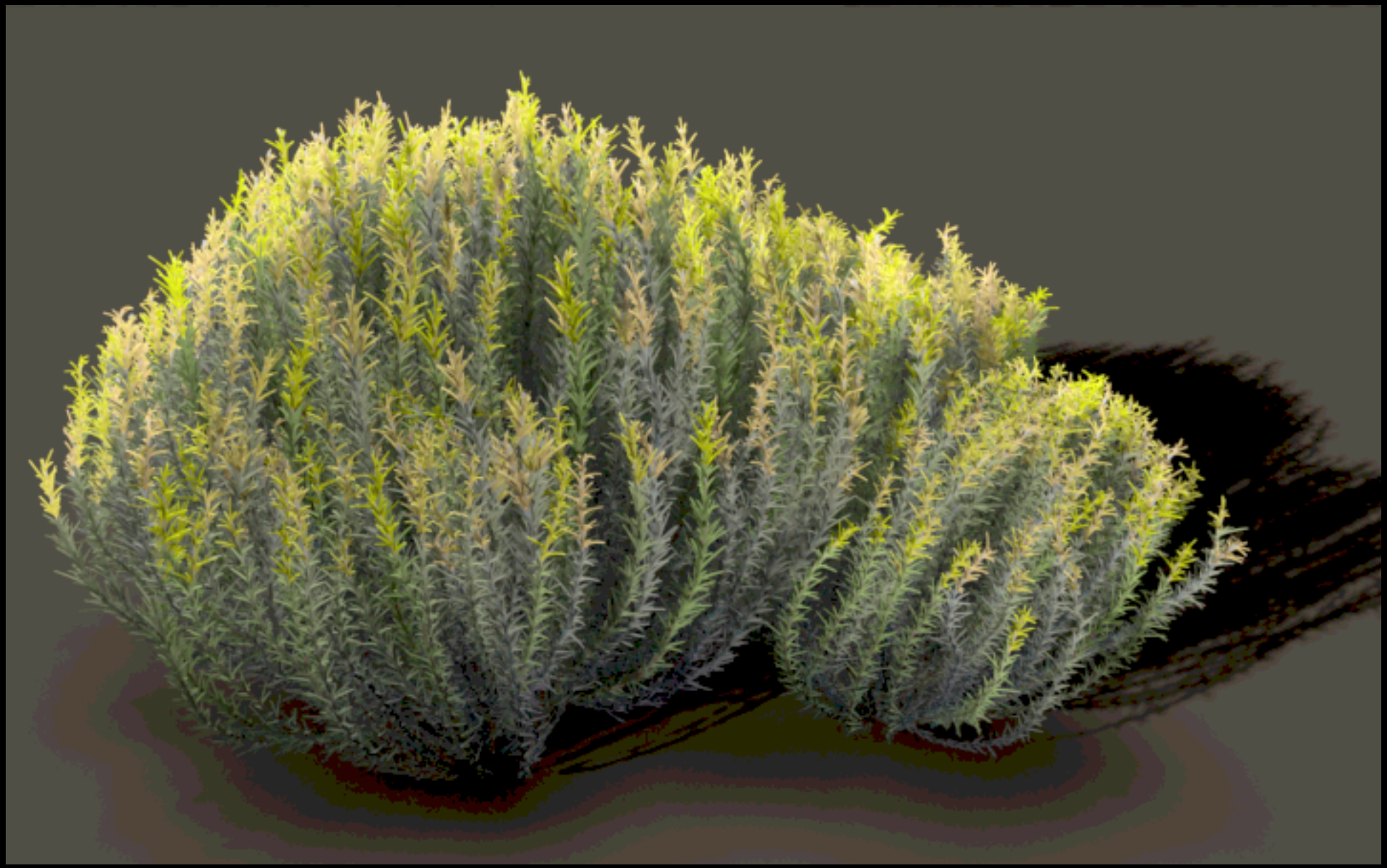


Do you really need that much detail?

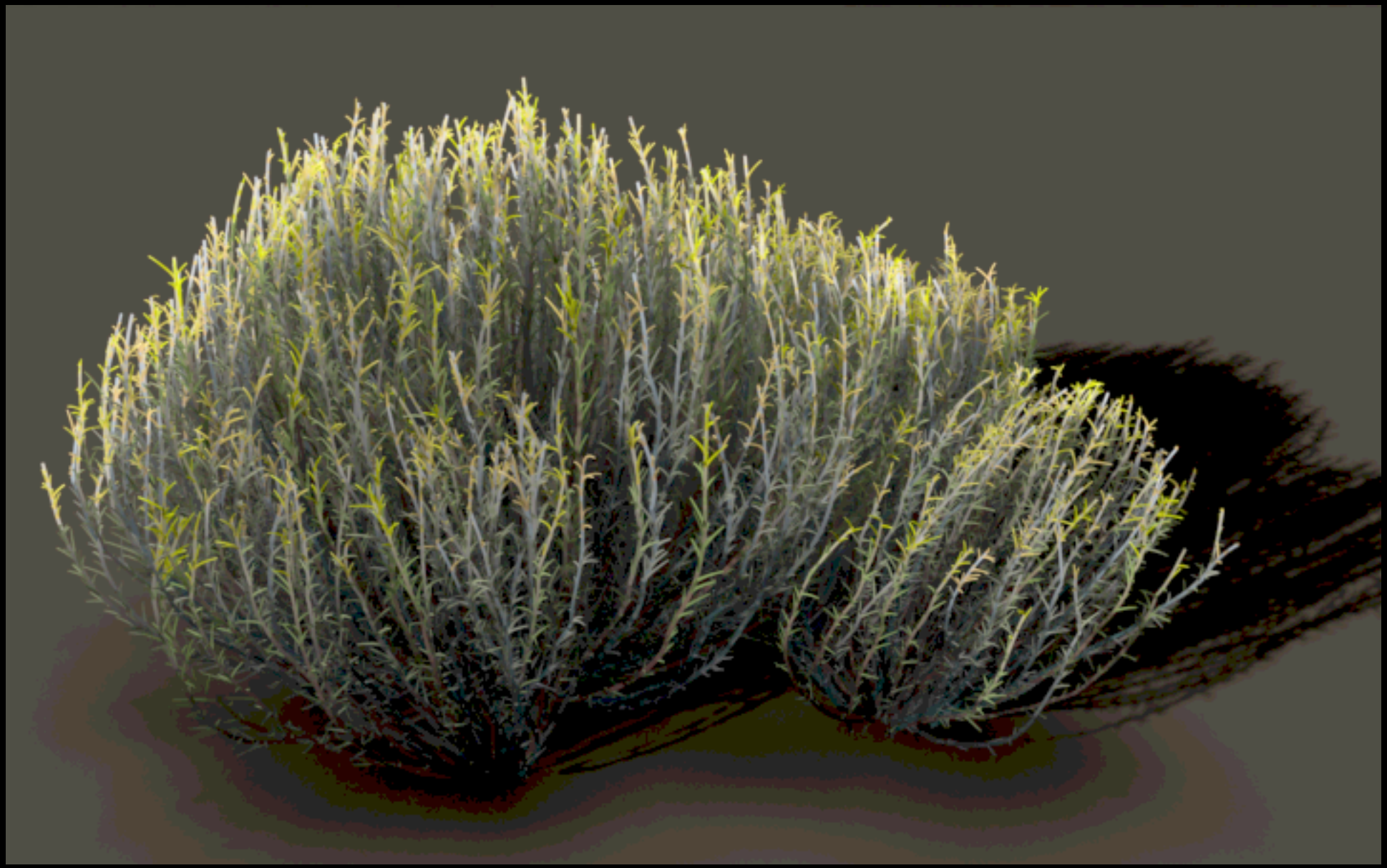
Stochastic “Pruning”



Detail Selection



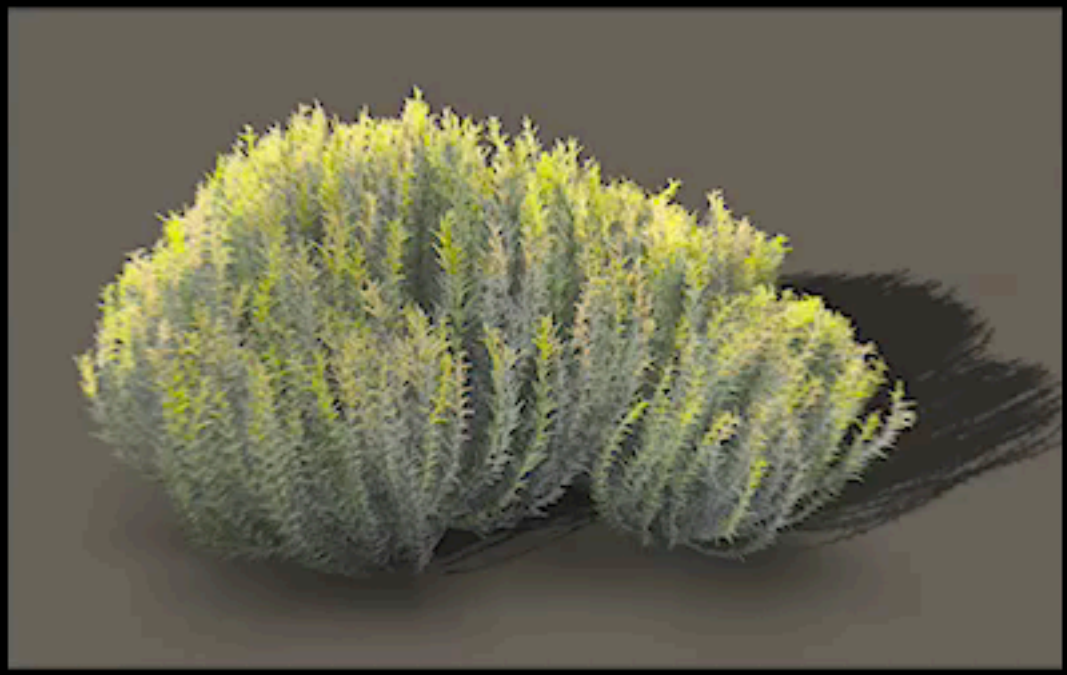
Area Preservation

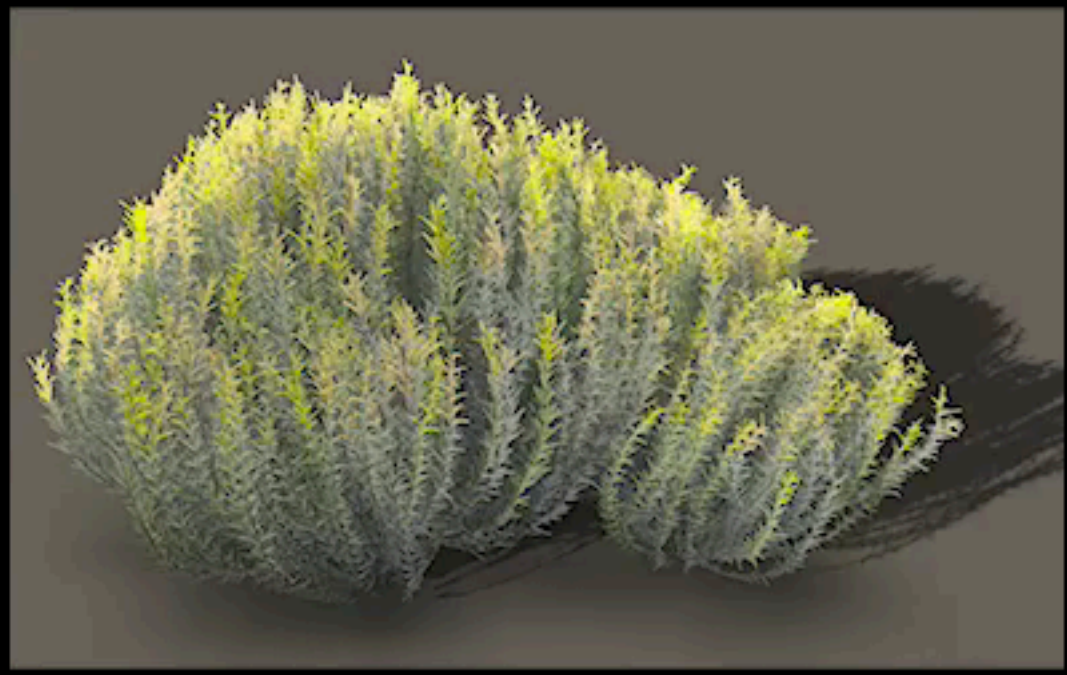


Area Preservation

Area Preservation

Fattening Neighbors





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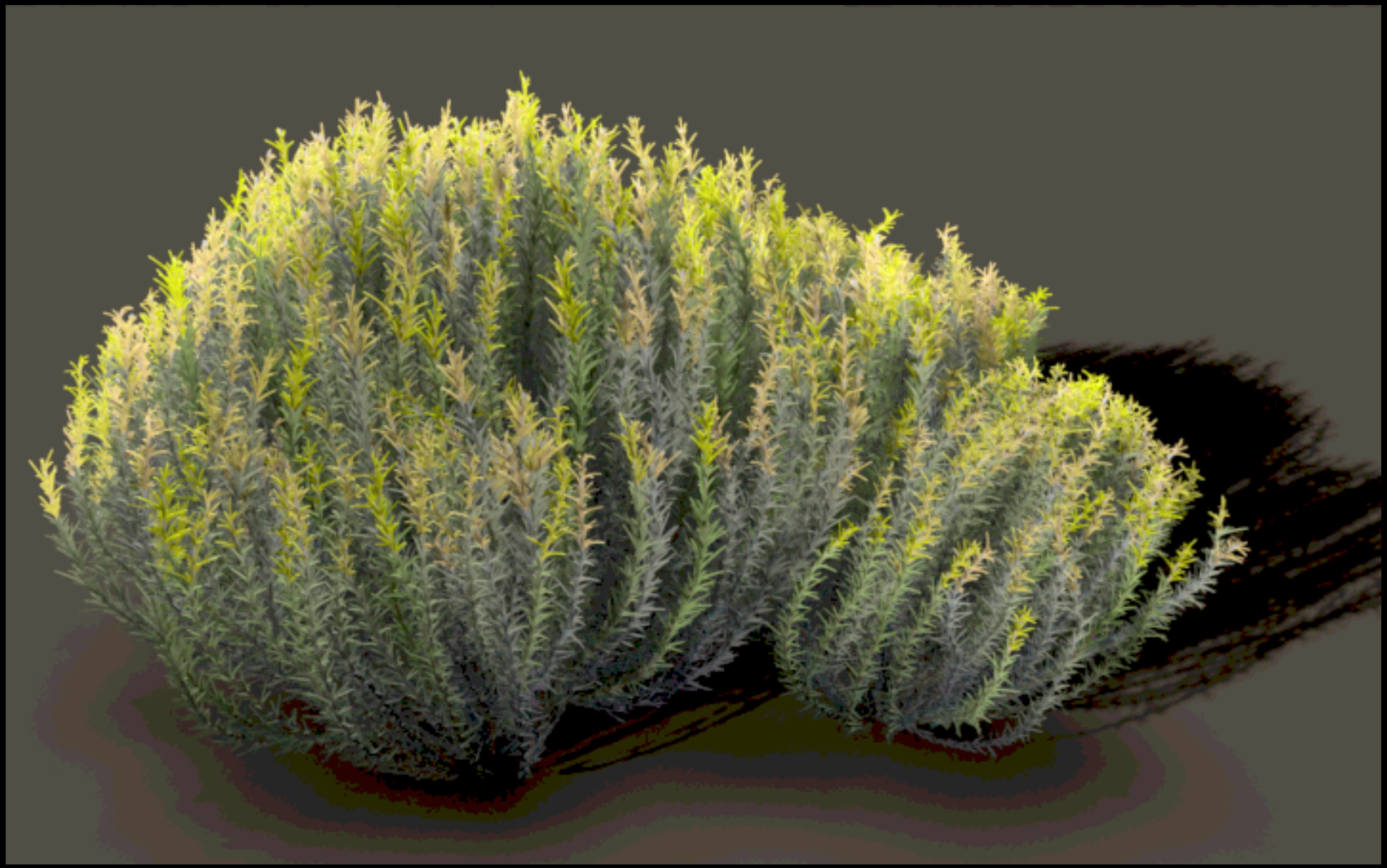
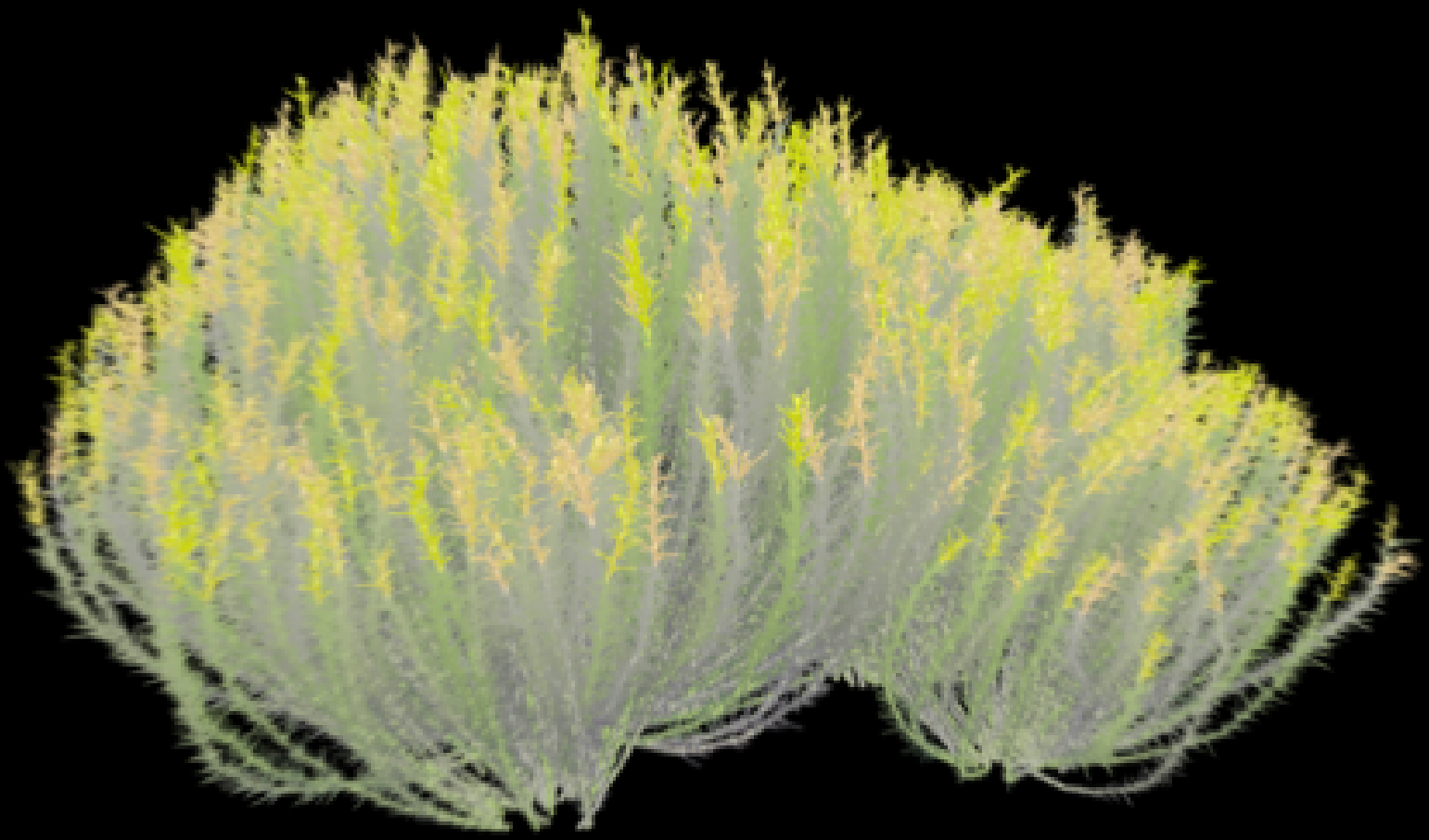


Contrast Compensation

Contrast Compensation

Shading Compensation



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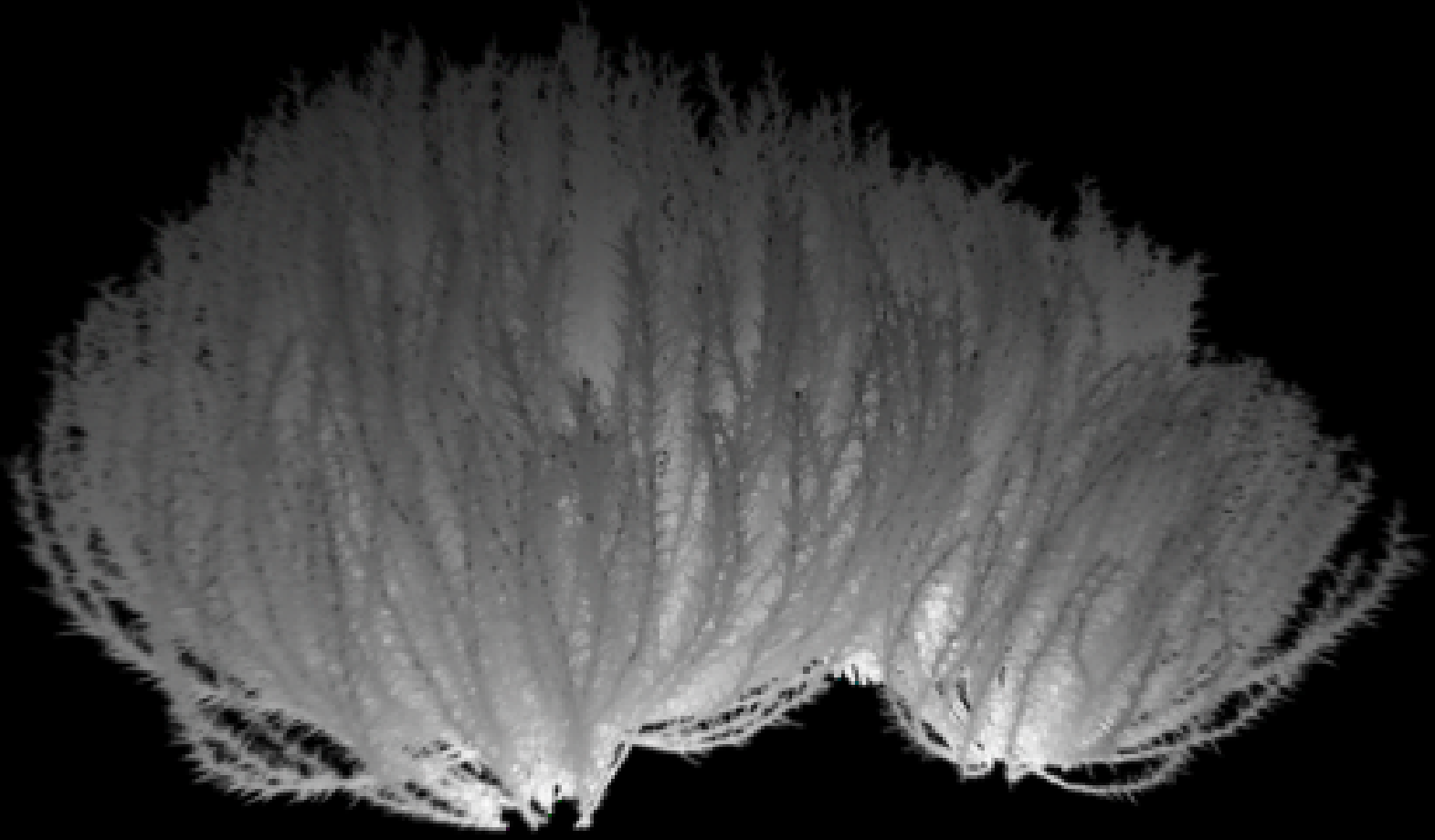
Shading Compensation



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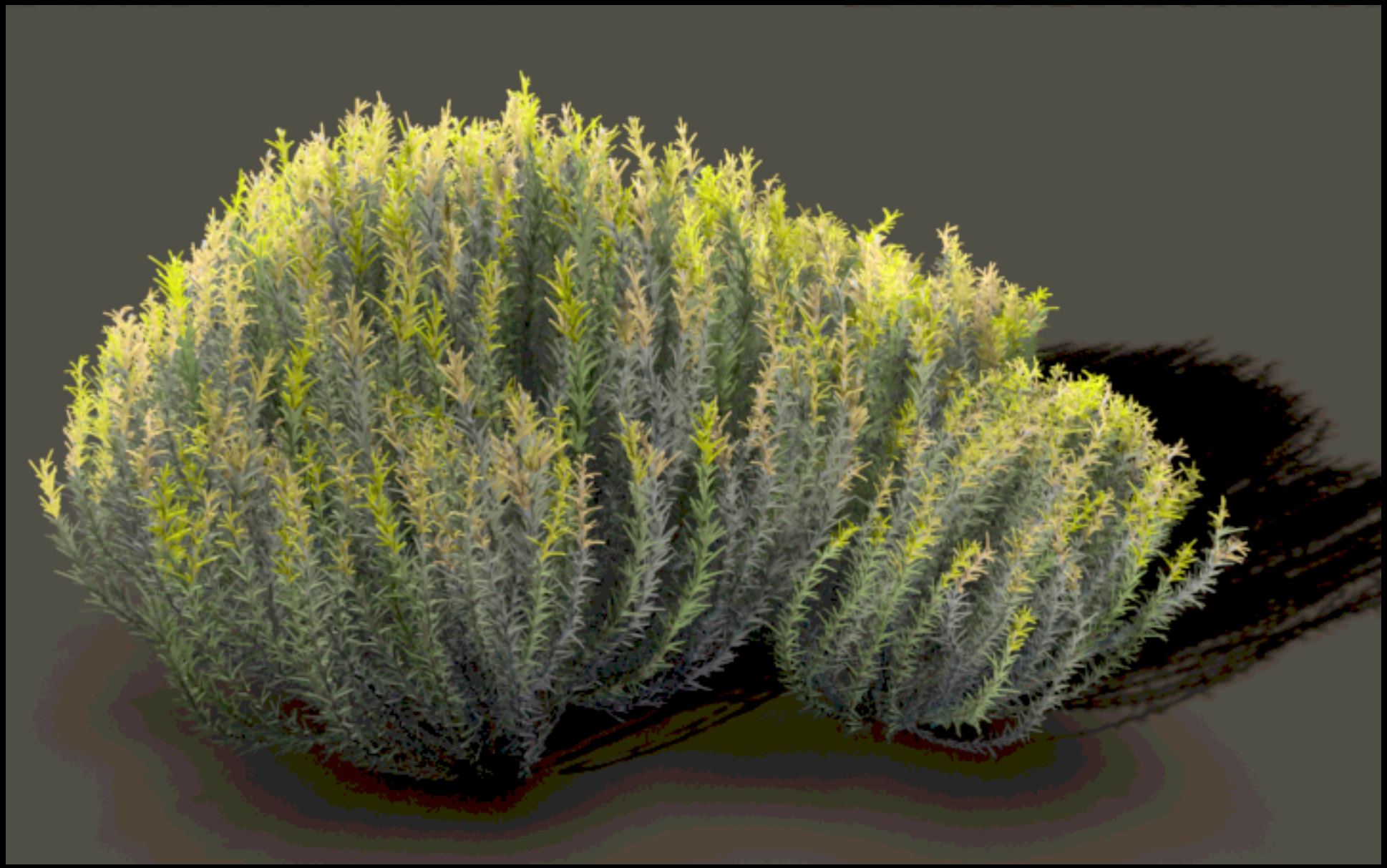

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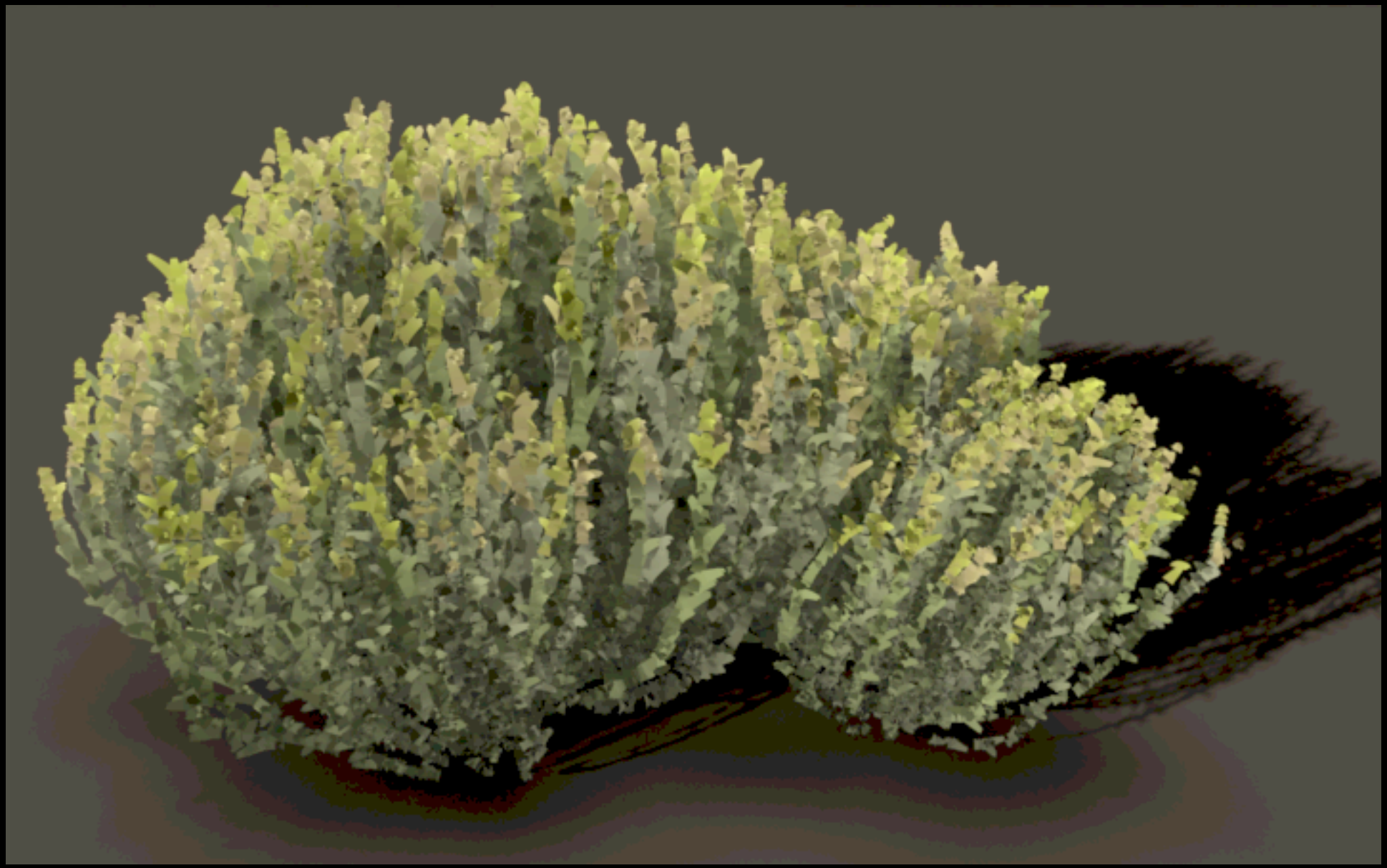

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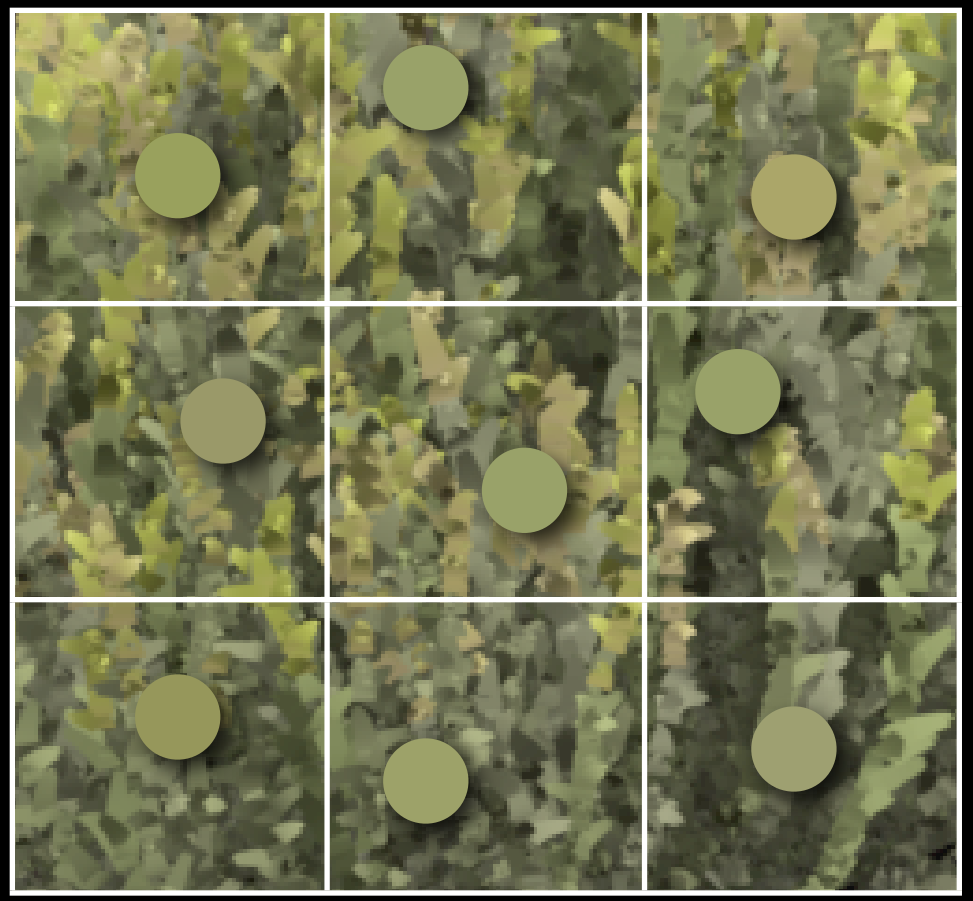

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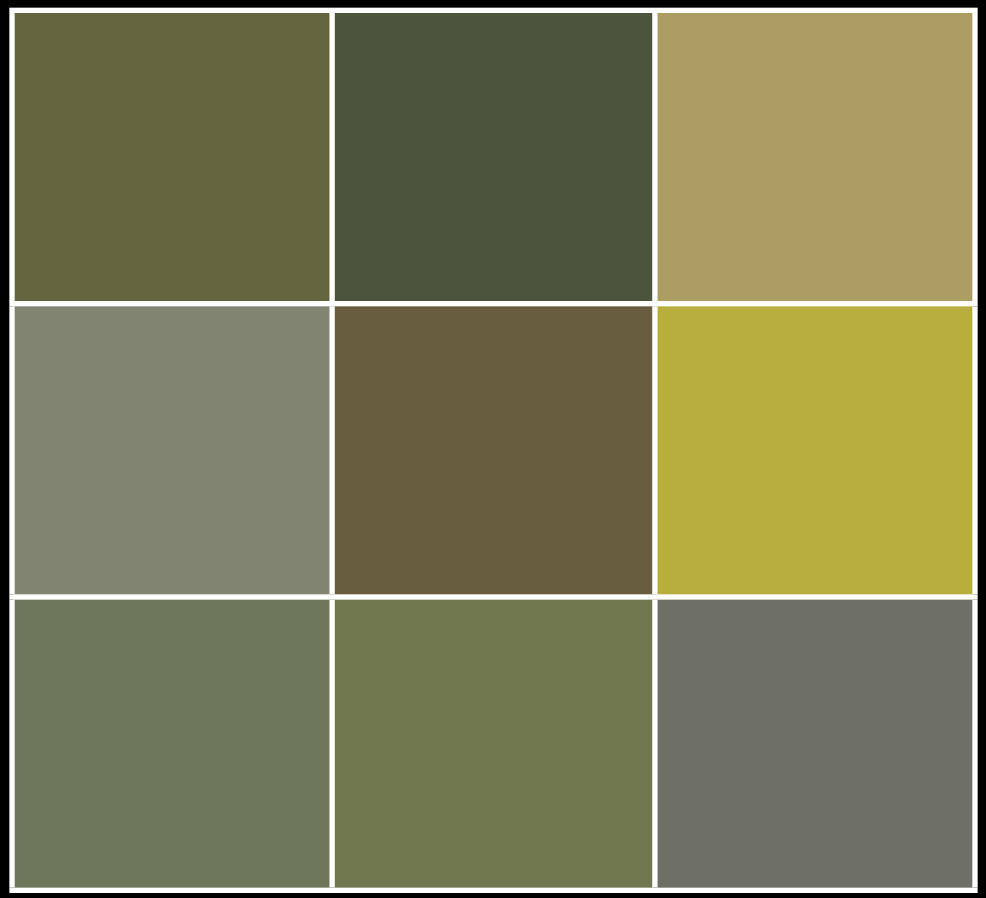
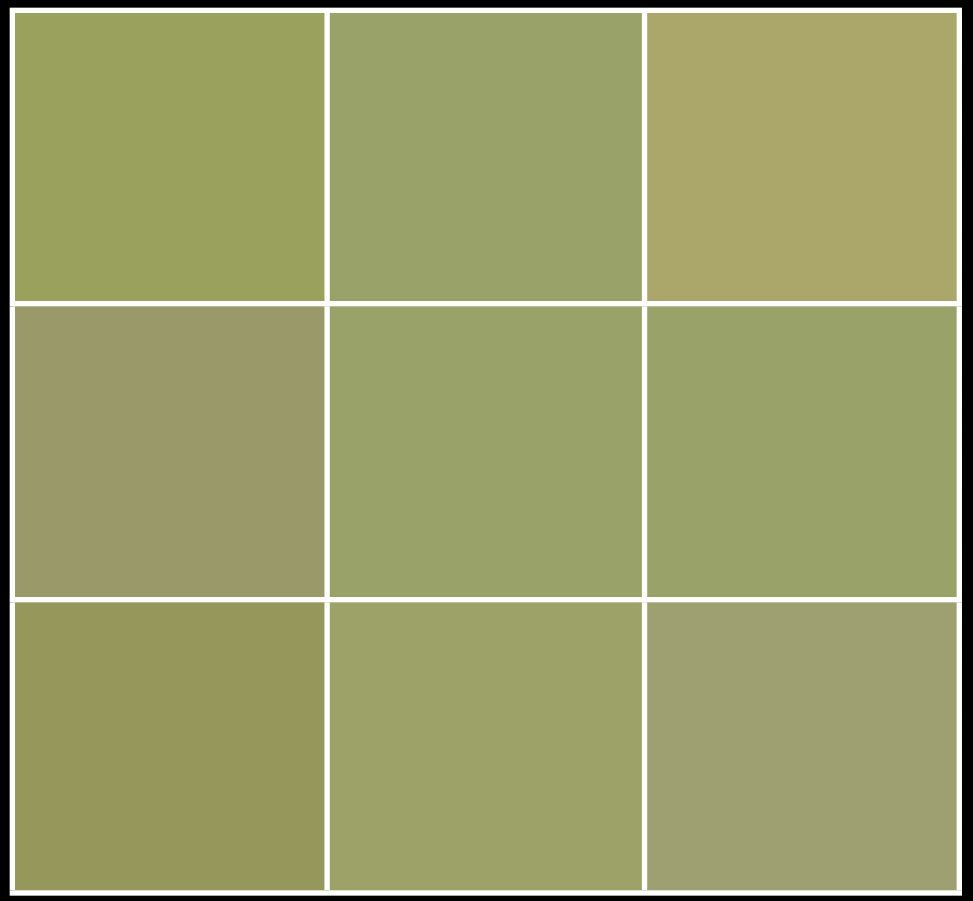
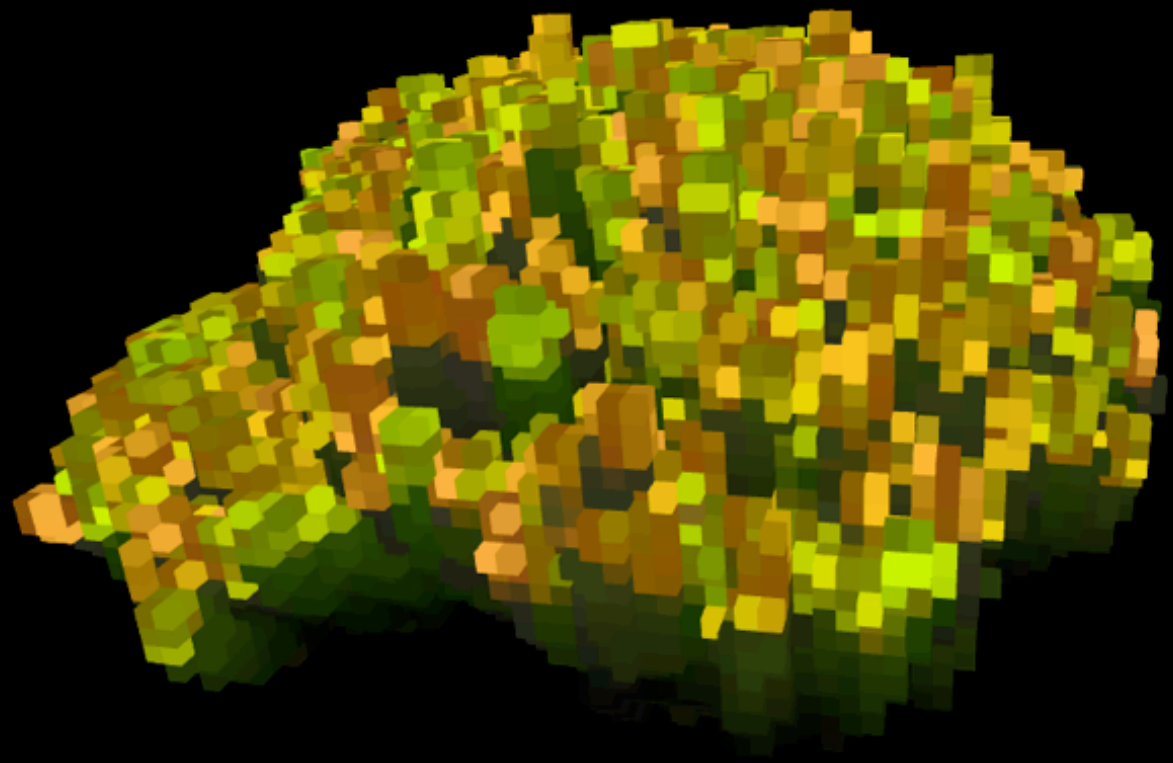




We can do better than the renderer



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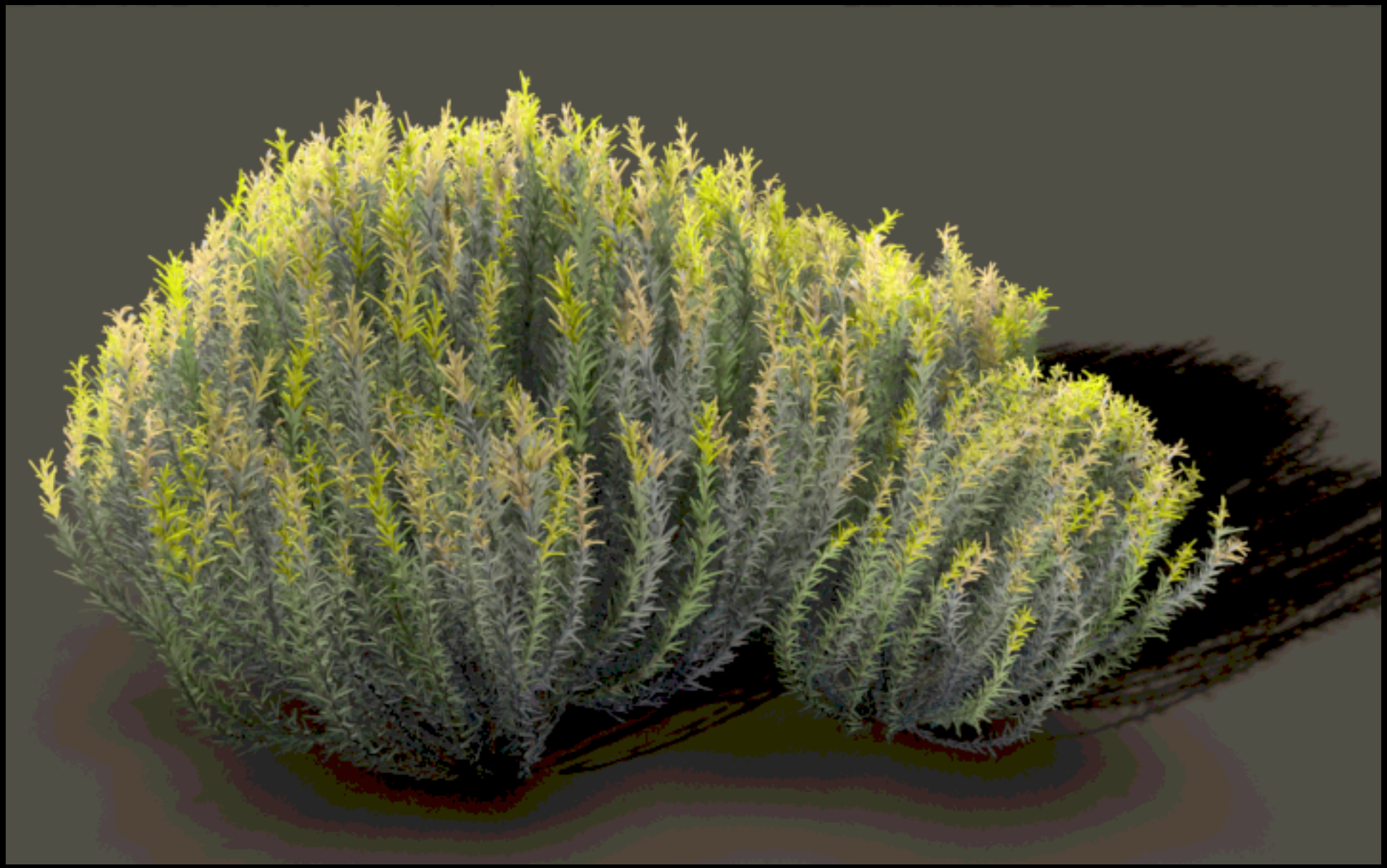

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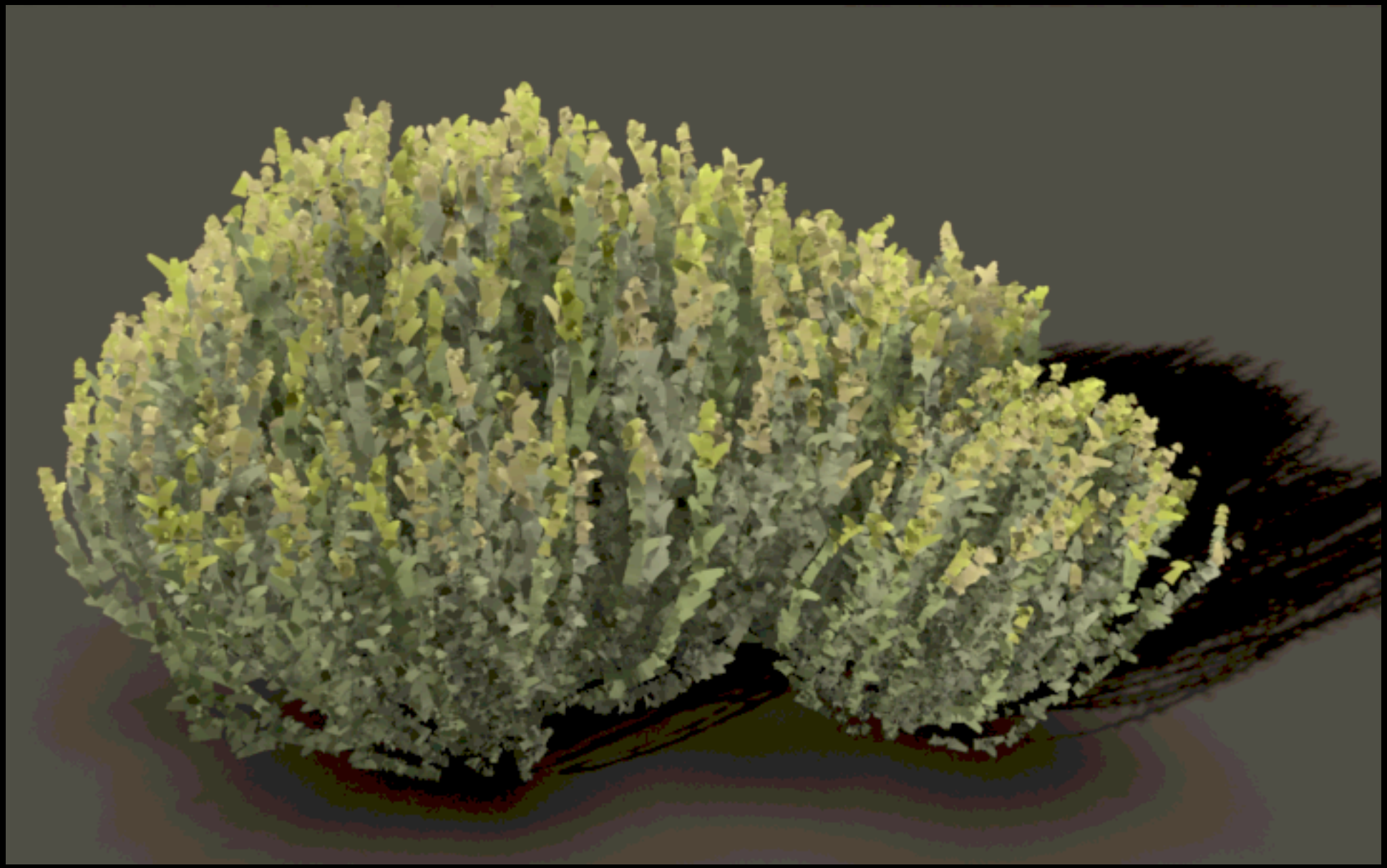

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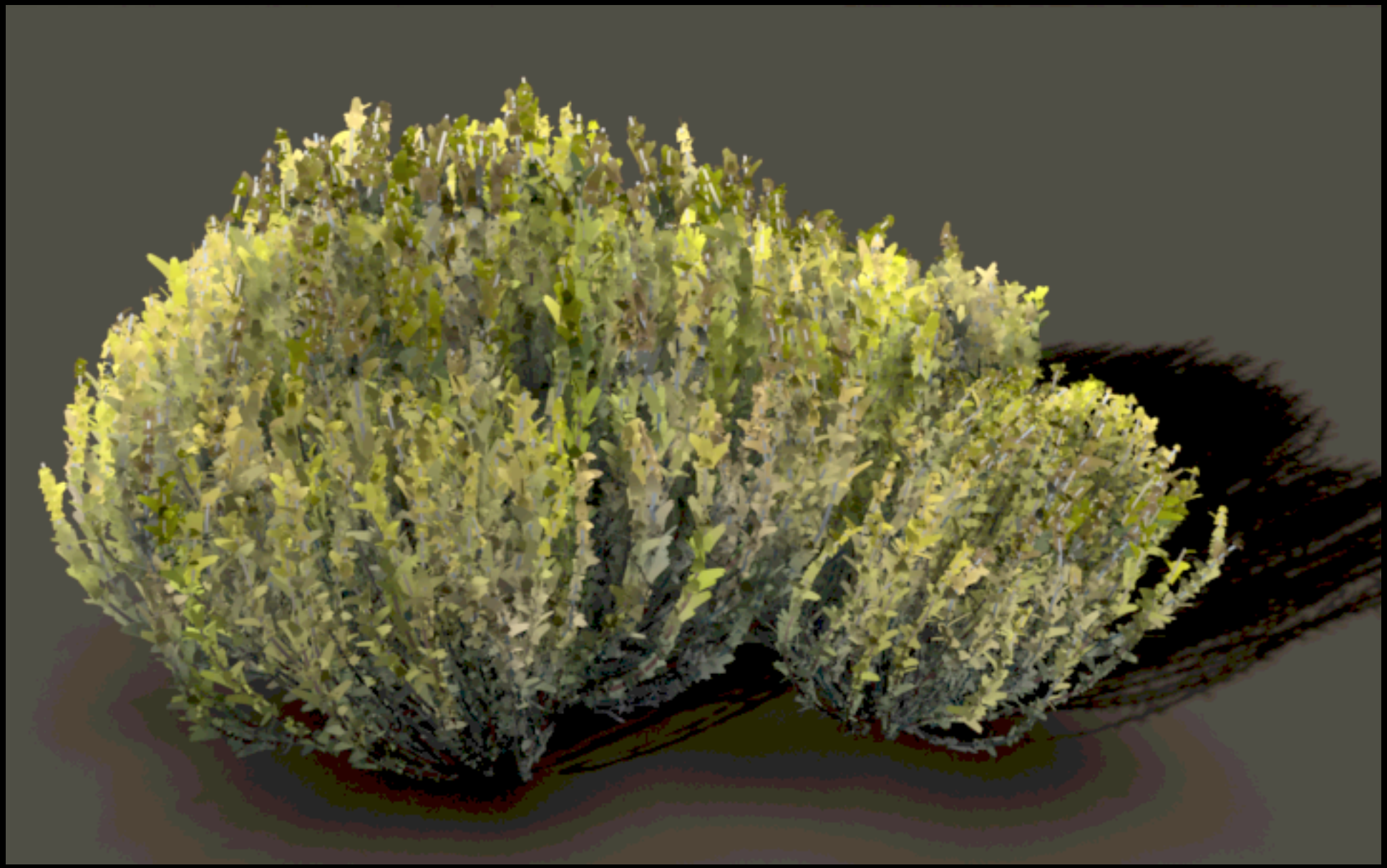

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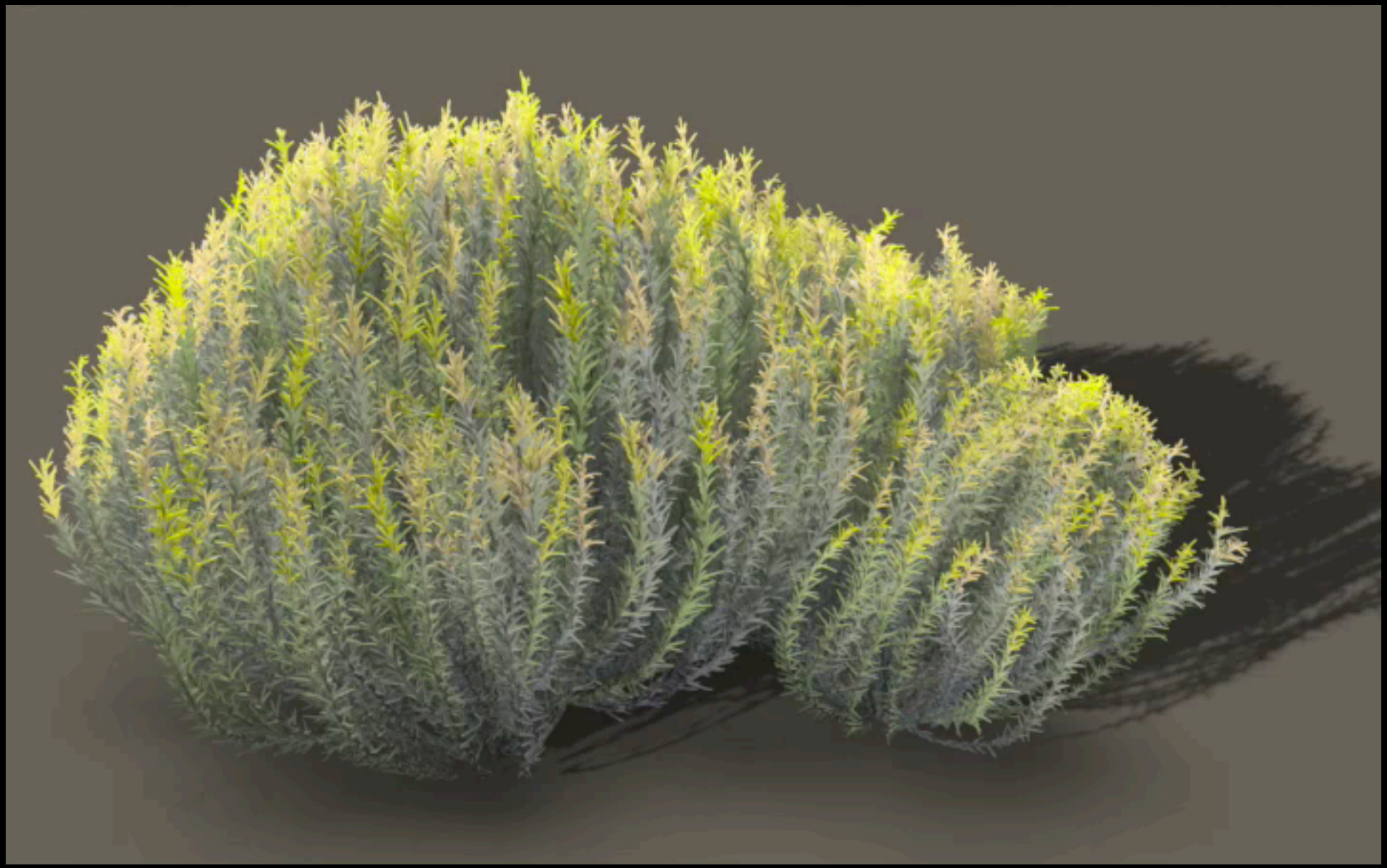
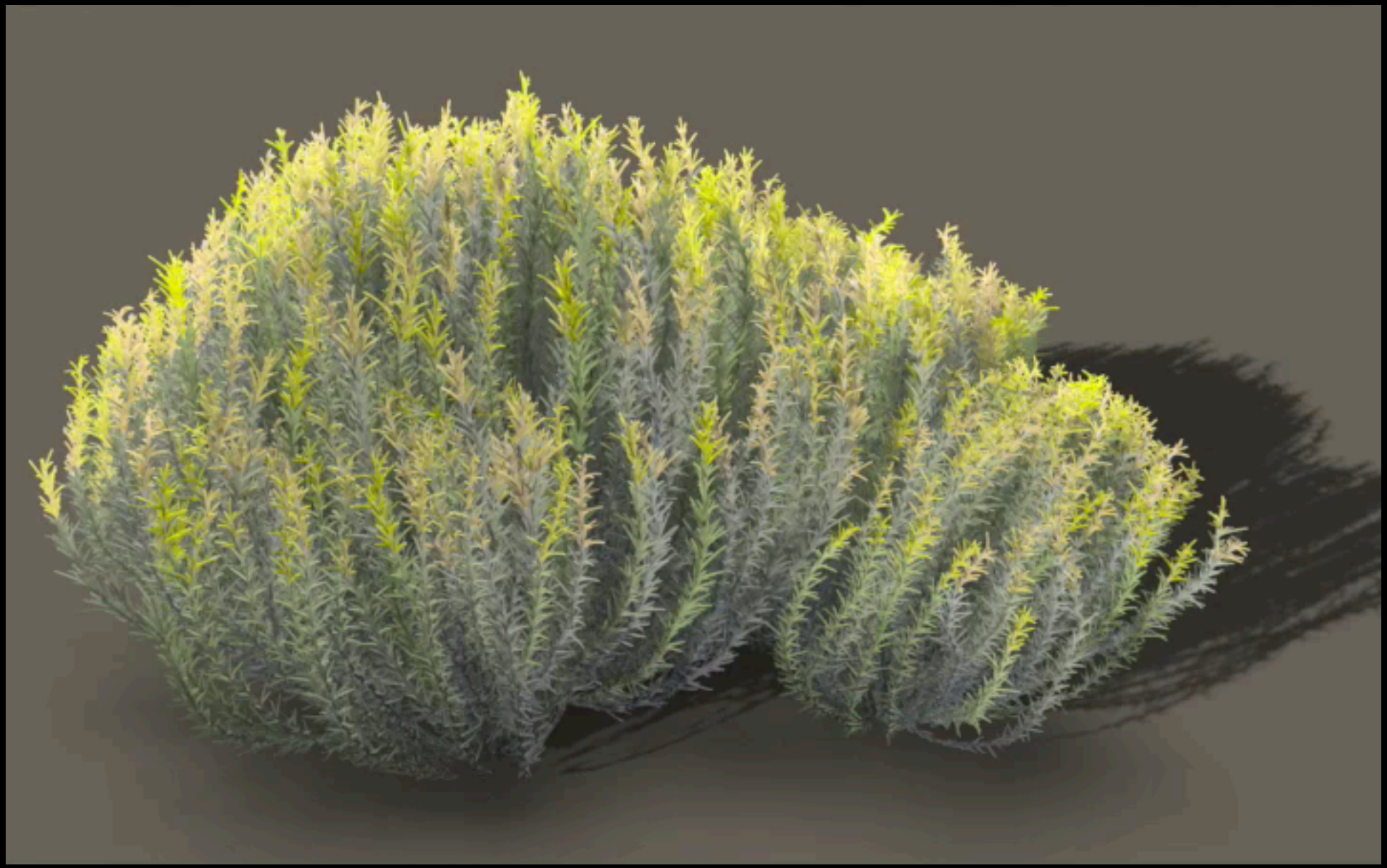
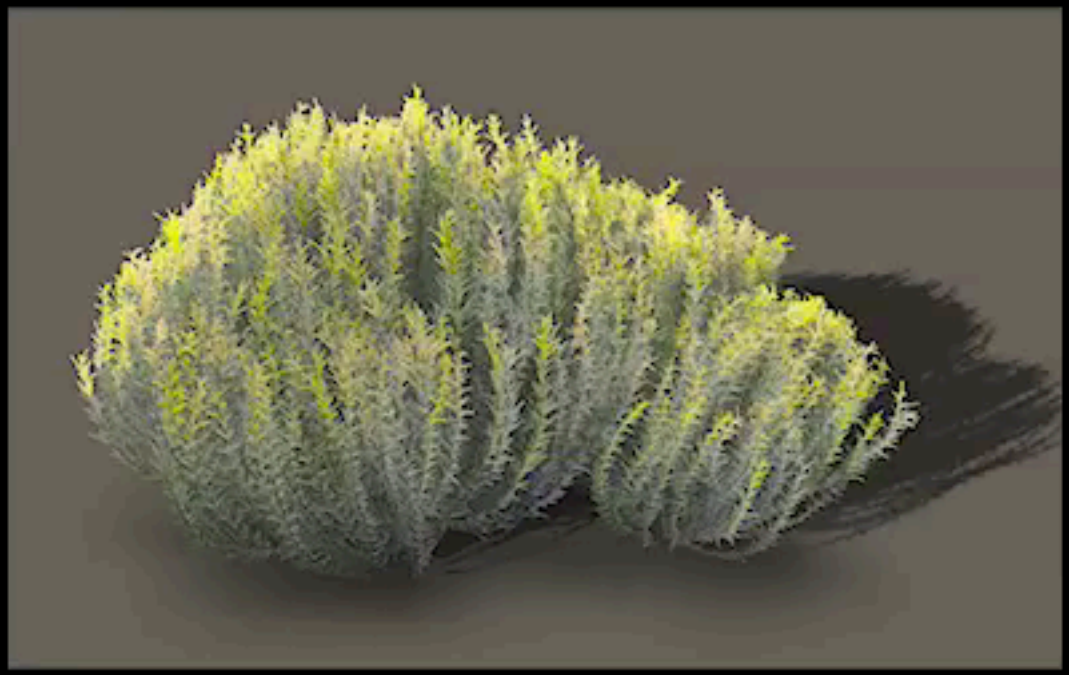


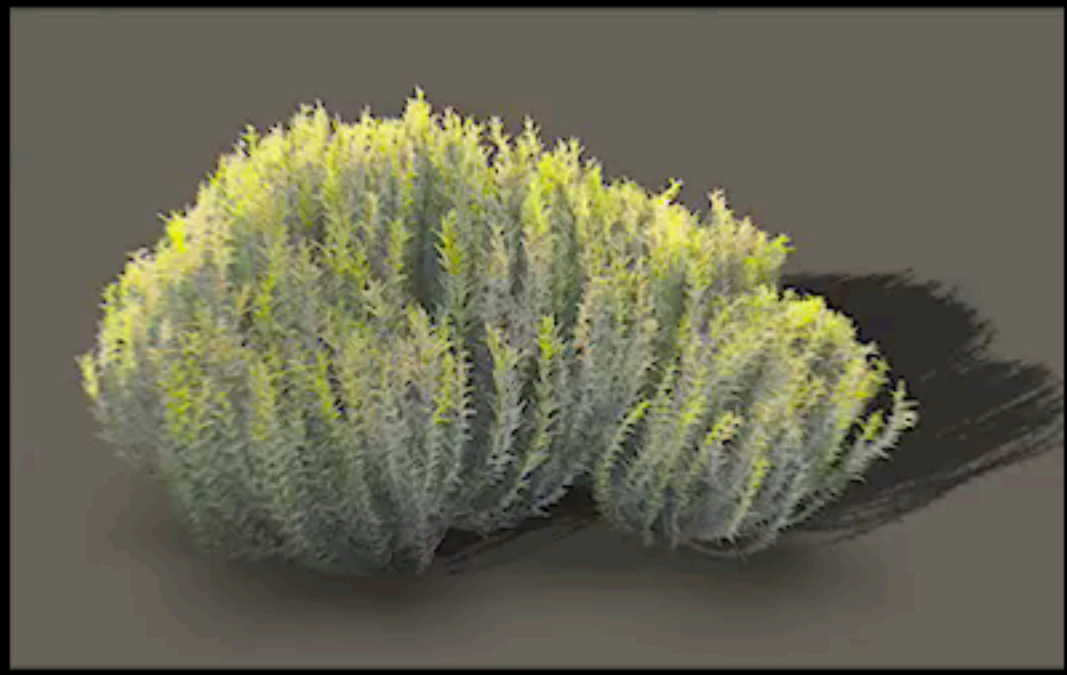
Smooth Animation



Smooth Animation

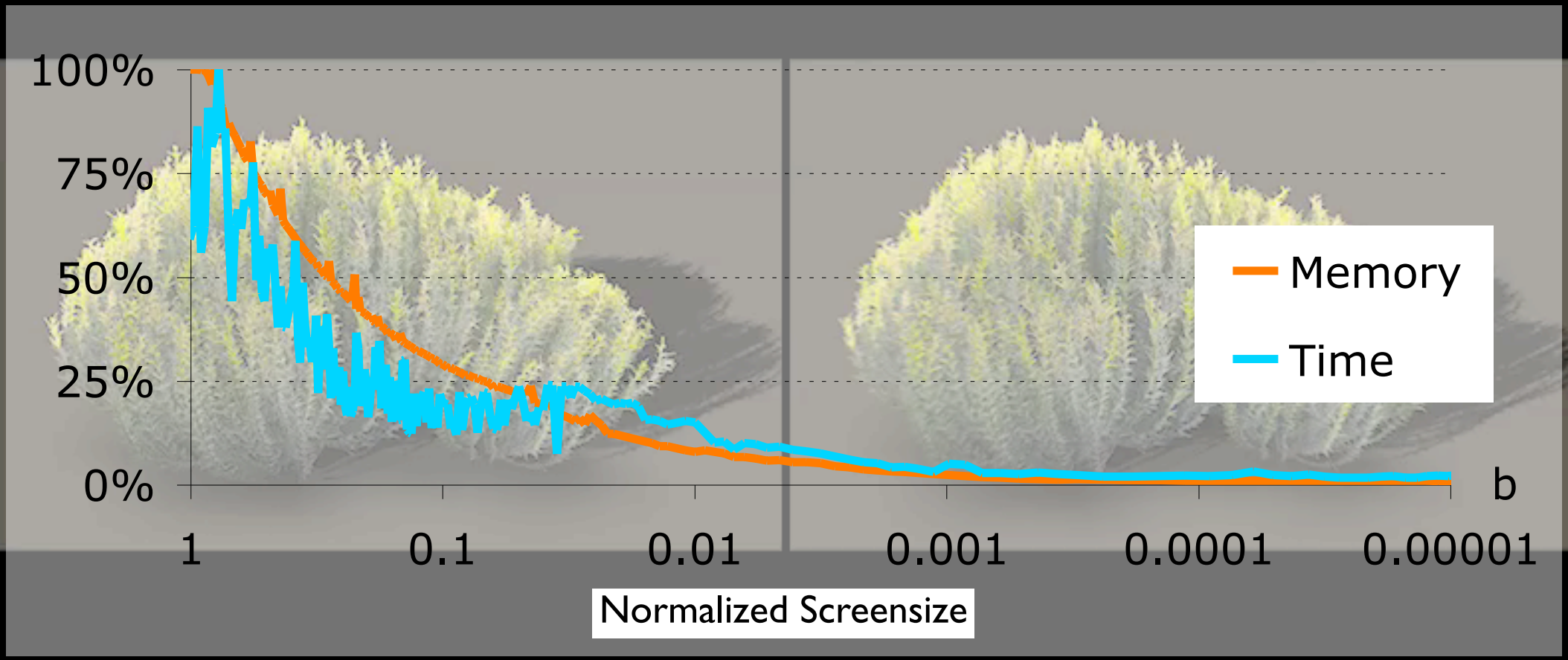
Visual Results





Sagebrush Results

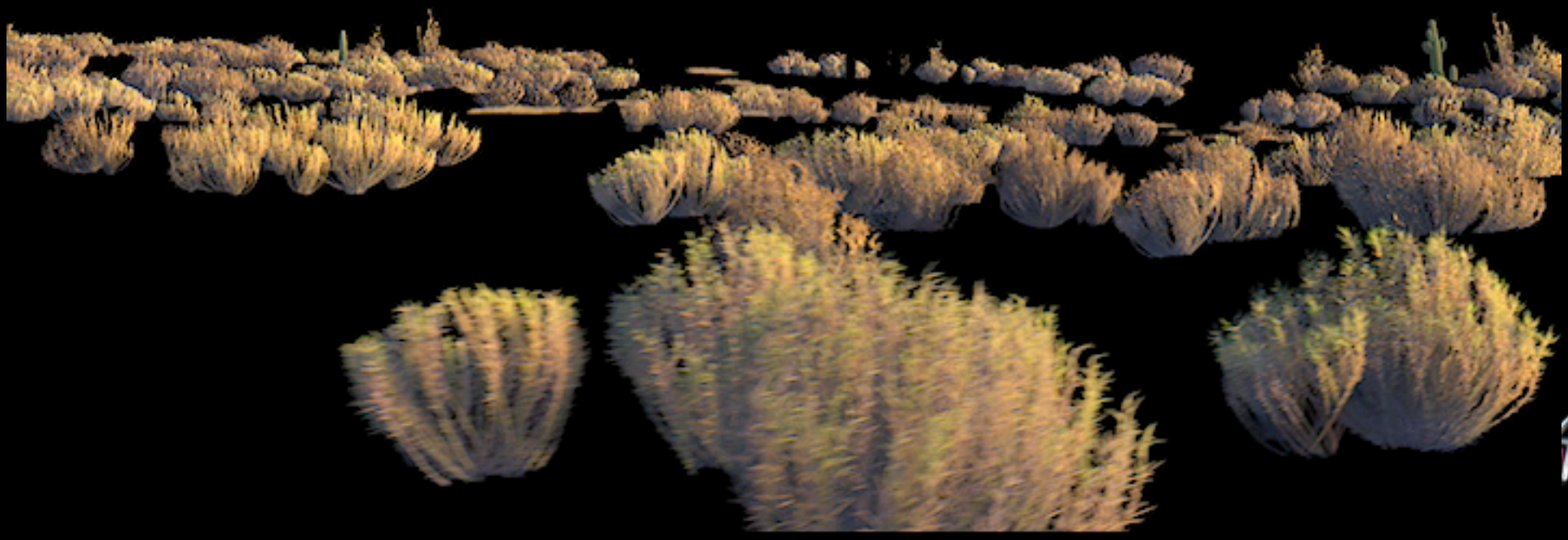
Time / Memory Savings



Sagebrush Results

Flo's Cafe
HERE
IT IS

MOTEL



Ratatouille

How about Hair?

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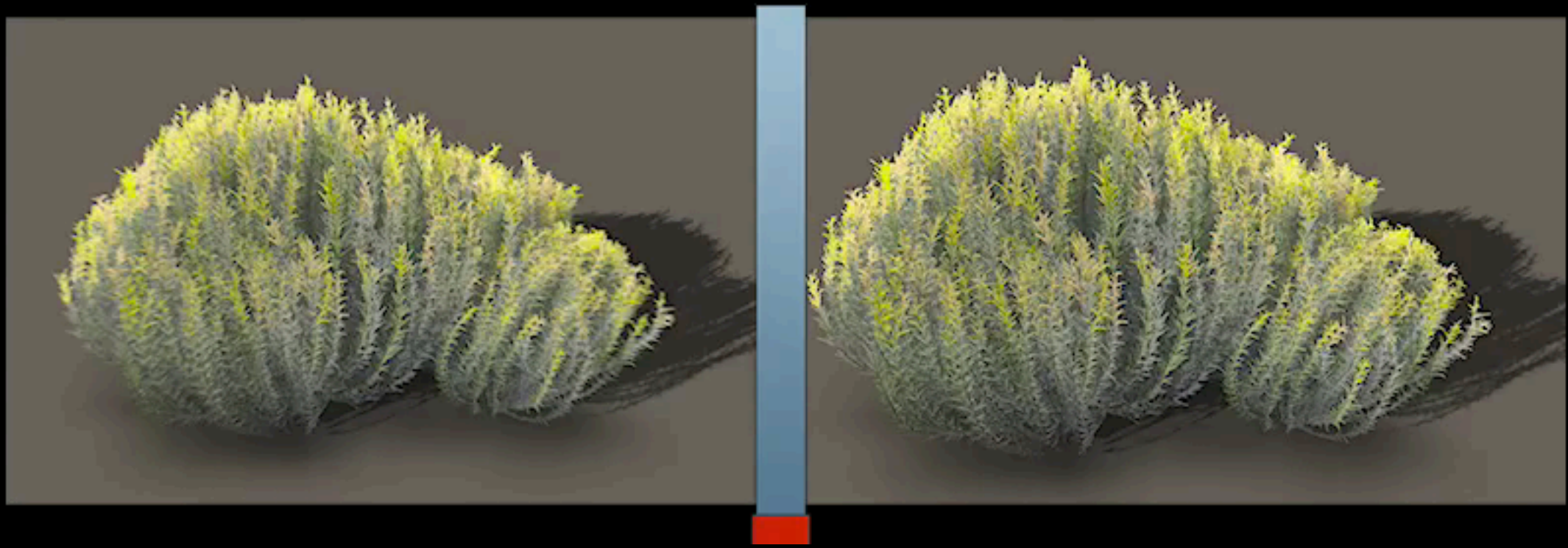
RATATOUILLE

Detail Selection



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Motion Blur Simplification

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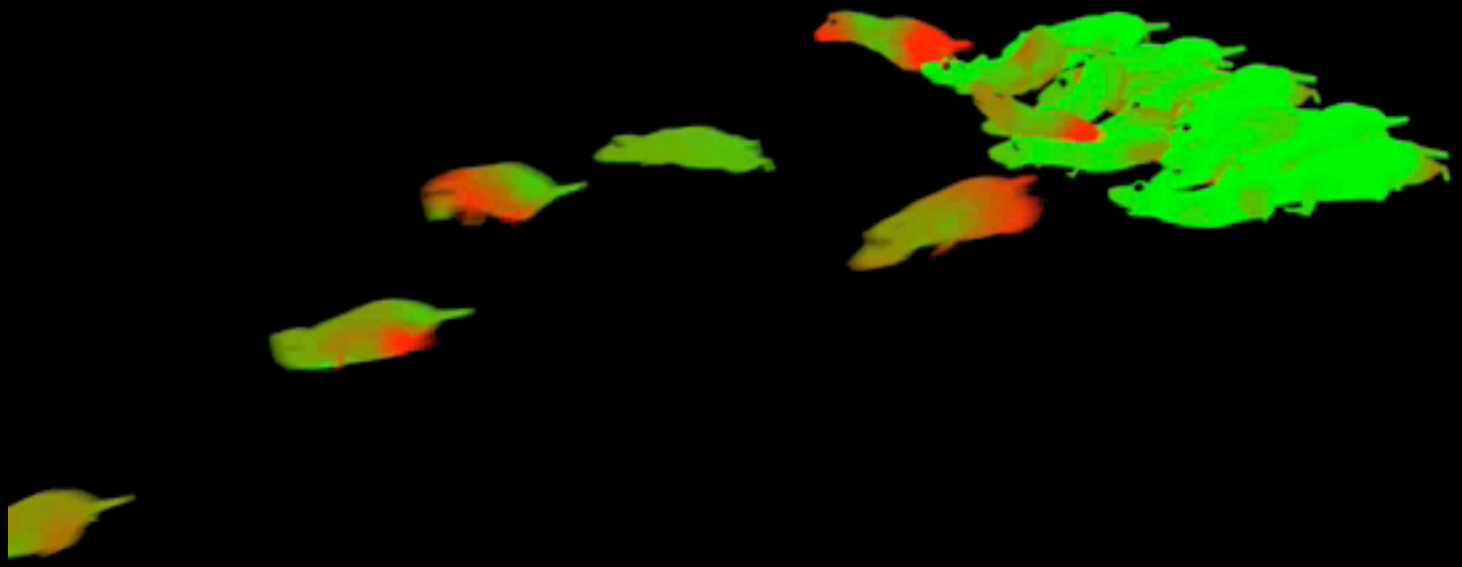

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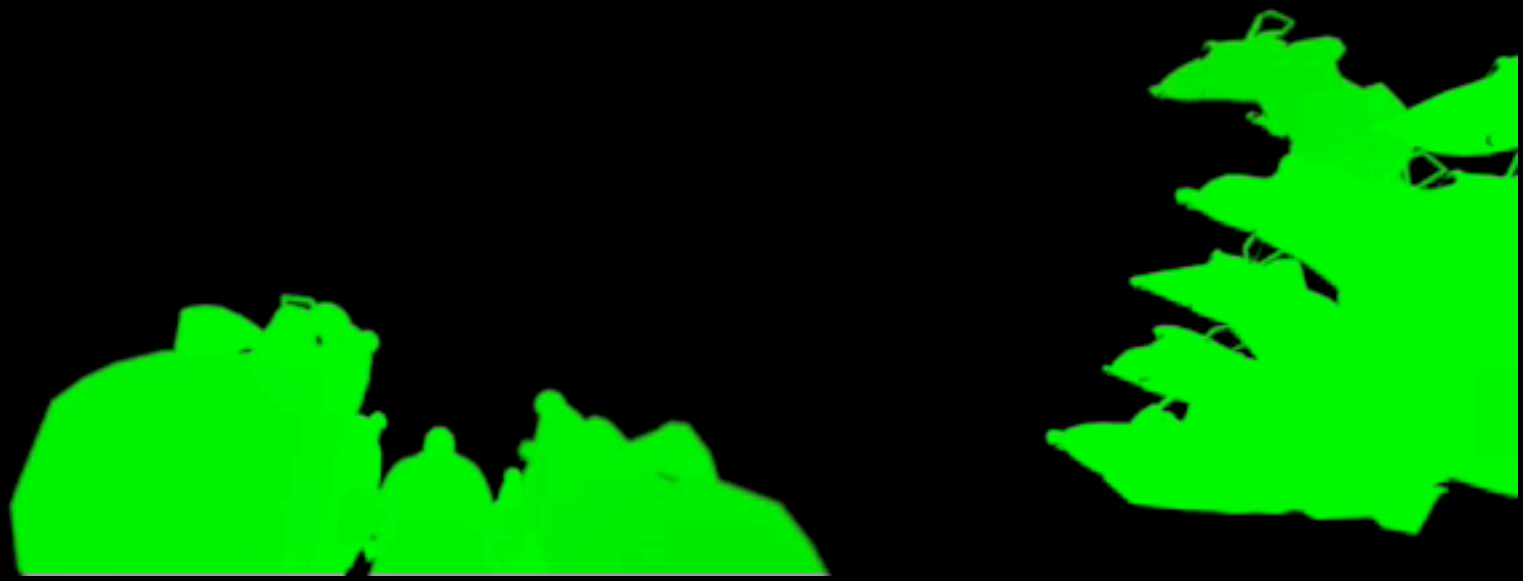
DOF Simplification

DOF Simplification



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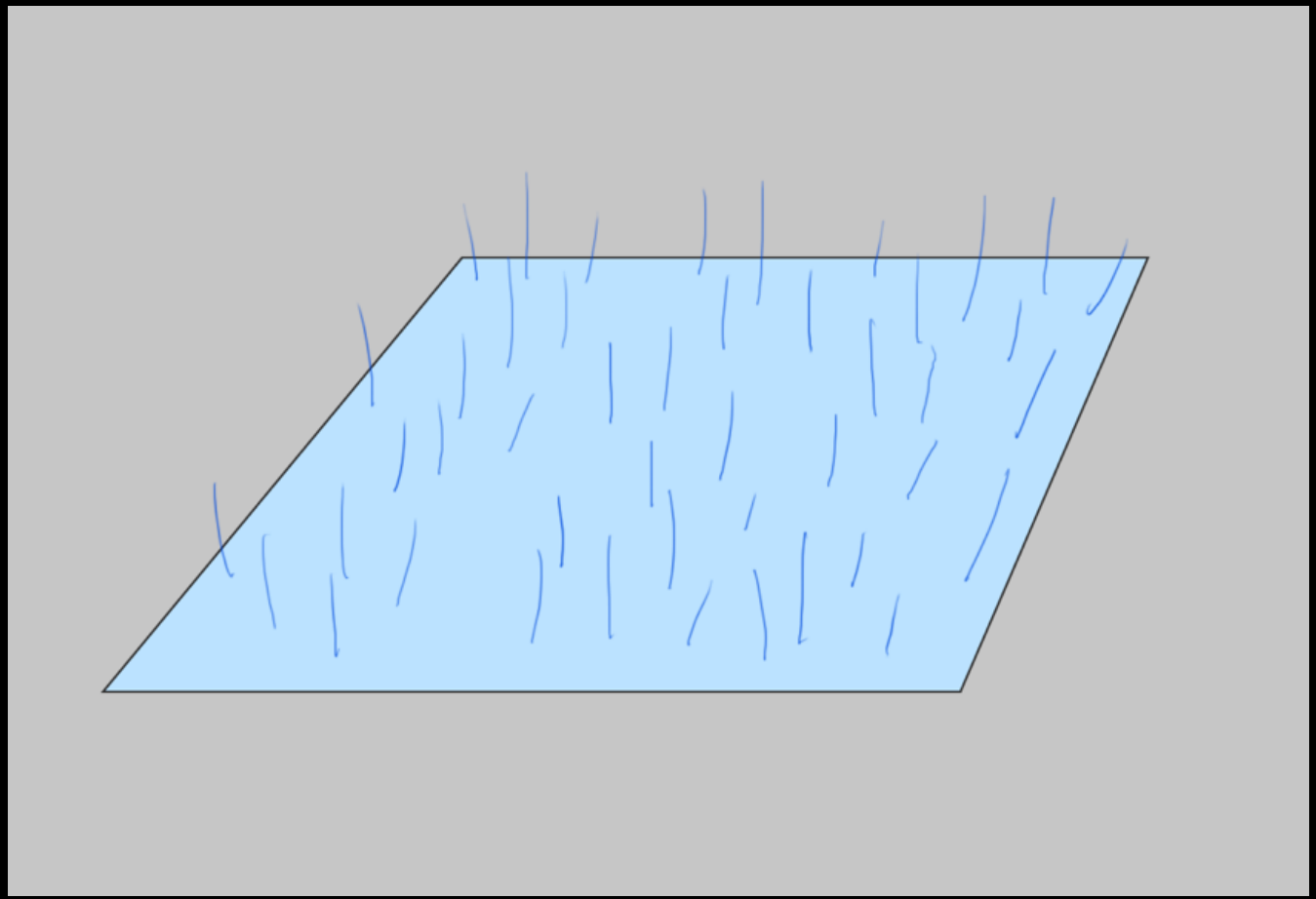
Random Pruning



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RATATOUILLE

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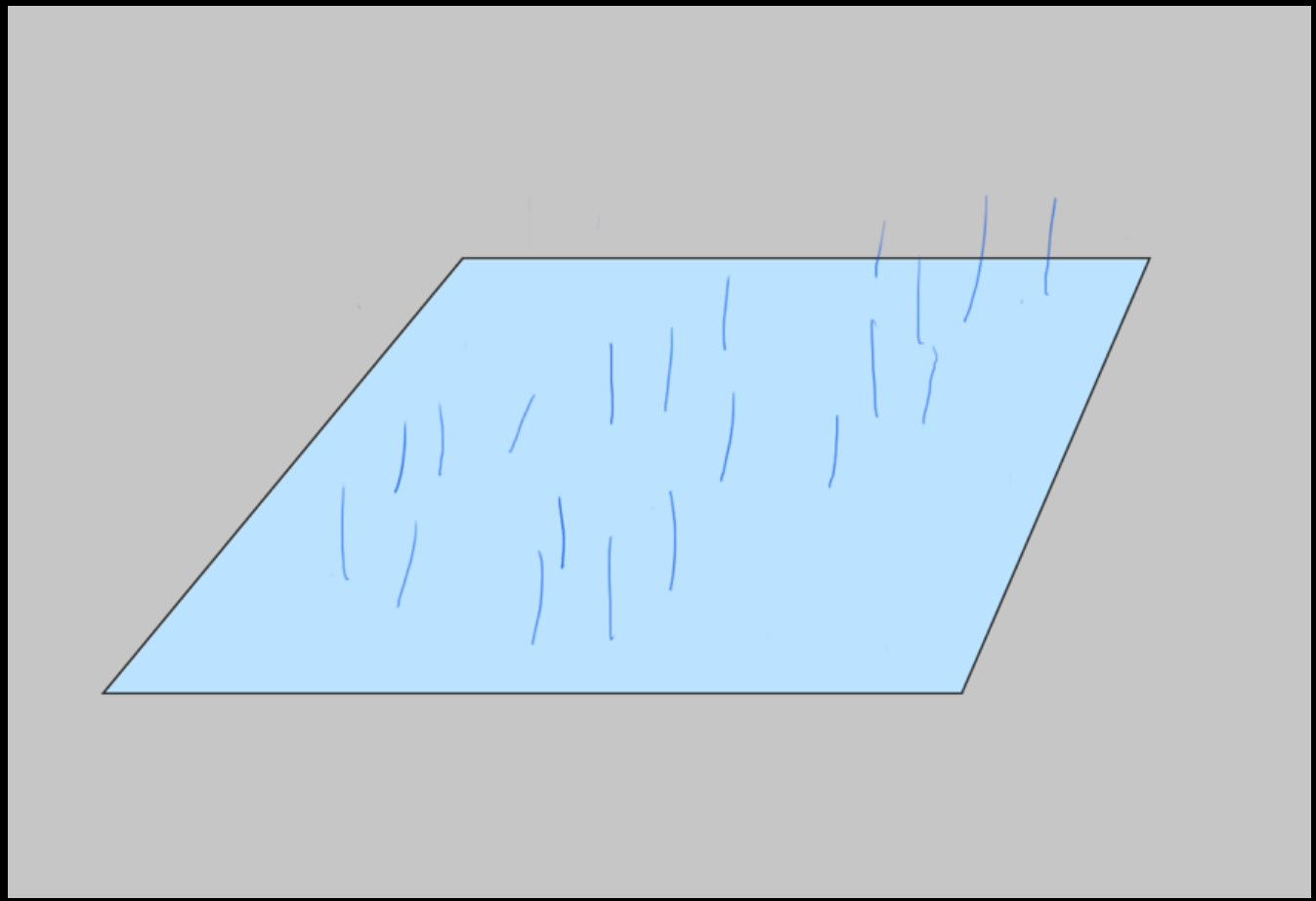

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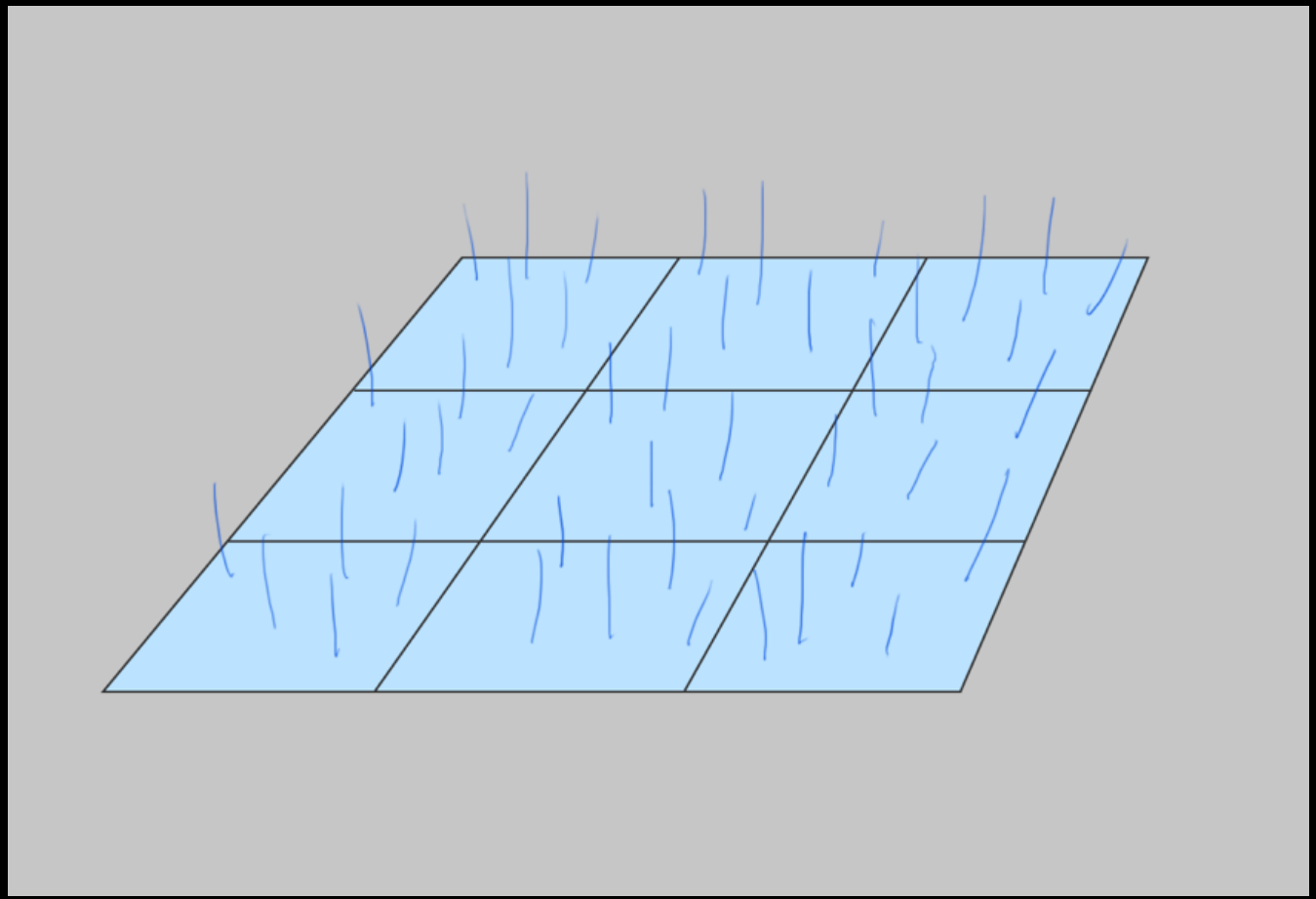
Stratified Pruning



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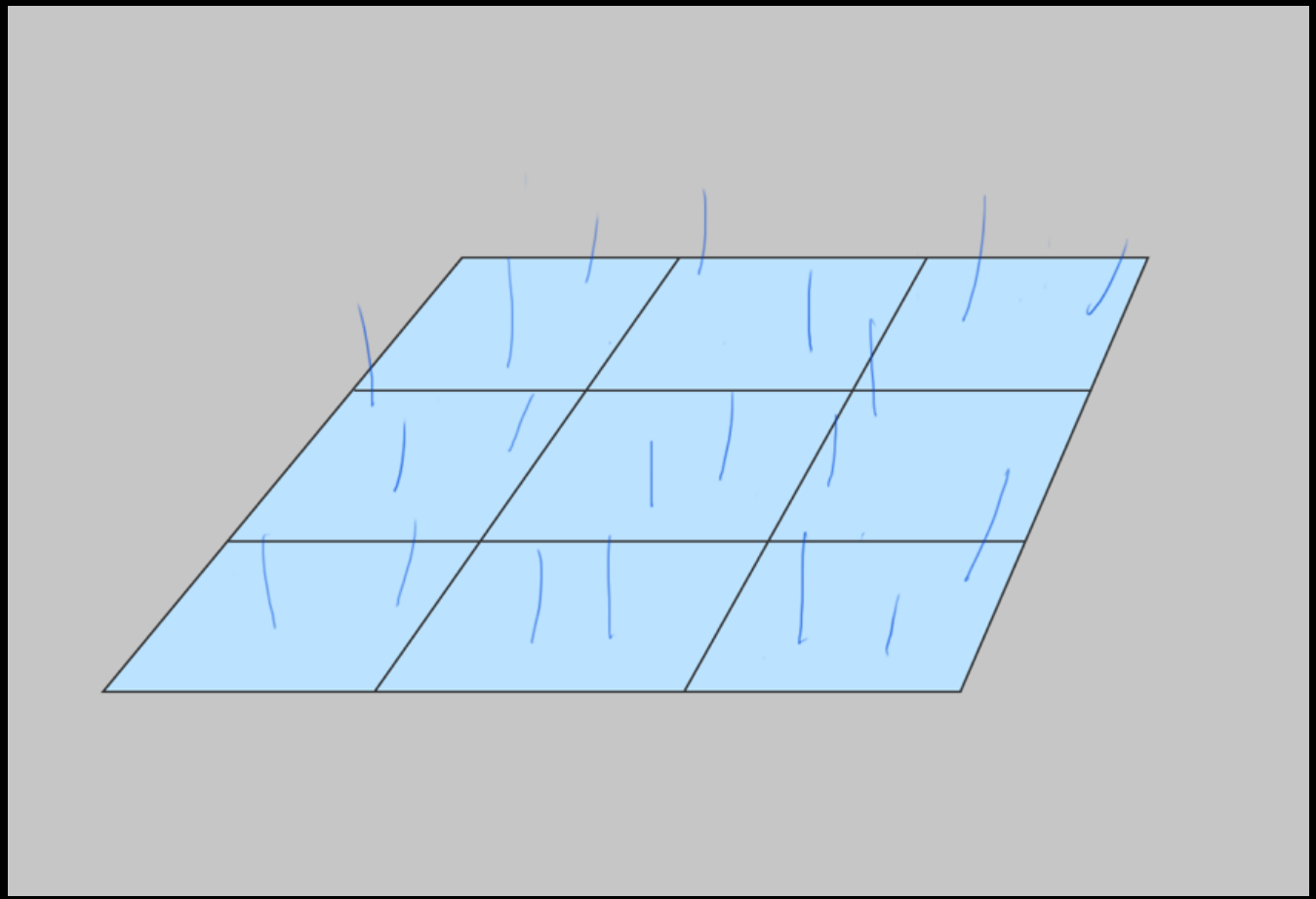
RATATOUILLE

Stratified Pruning



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Stratified Pruning

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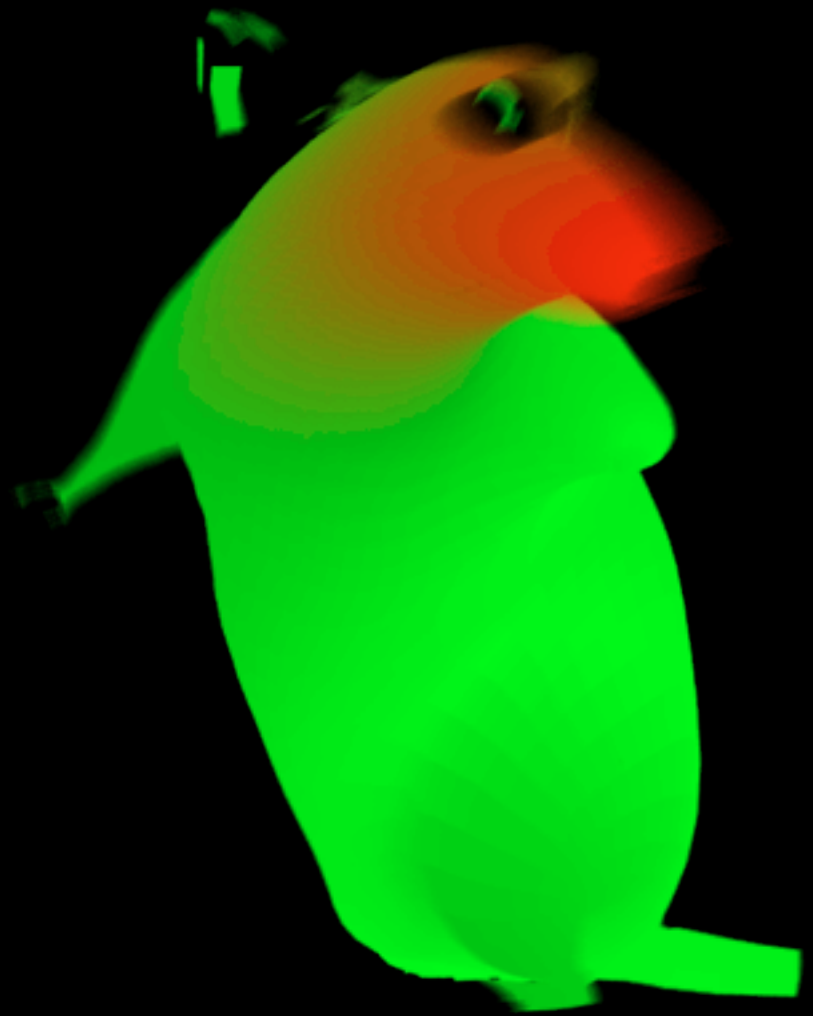
RATATOUILLE

Varying Detail

Varying Detail



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RATATOUILLE

Varying Detail

Results

Results

Conclusion

- Lots of complex procedural models
  - Vegetation, Hair,
  - Dirt, Explosions
- Hybrid approaches

Conclusion

- Lots of complex procedural models
  - Vegetation, Hair,
  - Dirt, Explosions
- Hybrid approaches

One more thing...

500 Million and Counting:
Hair Rendering on "Ratatouille"
8:30 am
Room 6DE

Rivers of Rodents:
An Animation-Centric Crowds Pipeline for "Ratatouille"
10:30 am
Room 6DE

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RATATOUILLE

Any Questions?