Wenlin Mao

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- URL:
  https://lifan.s3.amazonaws.com/hw3/753f8b7fe5e130109a25f047109ec5d6/201903190
  64117/index.html

- Acceleration strcuture: Bounding volume hierarchy We use bounding volume hierarchy
  to accelerate the algorithm. First, we pack each primitive into a bounding box, and we
  treat these boxes as new primitives. To construct the BVH tree, we take the vectors of all
  objects and combine their bounding box as the root bounding box. Then we partition
  them into 2 based on the midpoint of the x, y, z axis of the current bounding box. After
  that, we recursively traverse down the tree and partition left and right node of the root
  node. When reach to the end, we put the actual primitive to the BVHNode. In order to
  find intersection, we call bvhIntersect and search from root node and check whether the
  ray is intersect with the BVHNode. If not intersect with itself, then directly return default
  Intersection object which means no intersection, otherwise check recursively to the left
  and right children. If both children intersect, choose the one with closer intersection
  distance and return back. If only one intersection happened, directly return it back. If no
  intersection on both left and right, return not intersect with default Intersection object. In
  this way, we optimized the algorithm of finding intersection between objects from O(n) to
  O(log(n)) where n is the number of objects.

- EC attemped and presented at: https://github.com/WenlinMao/Raytracer

- Performance after add acceleration:

```
Image successfully saved!
scene4-ambient.png
finished computation at Mon Mar 18 23:37:50 2019
elapsed time: 0.63896s
Image successfully saved!
scene4-diffuse.png
finished computation at Mon Mar 18 23:37:51 2019
elapsed time: 0.644832s
Image successfully saved!
scene4-specular.png
finished computation at Mon Mar 18 23:37:52 2019
elapsed time: 0.680284s
Image successfully saved!
scene4-emission.png
finished computation at Mon Mar 18 23:37:52 2019
elapsed time: 0.590172s
Image successfully saved!
scene5.png
finished computation at Mon Mar 18 23:37:53 2019
elapsed time: 1.06105s
Image successfully saved!
scene6.png
finished computation at Mon Mar 18 23:37:57 2019
elapsed time: 3.43183s
Image successfully saved!
scene7.png
finished computation at Mon Mar 18 23:38:00 2019
elapsed time: 3.24003s
```