Can we make it faster? Ideas?

intersects bounding sphere but a lot of empty space between sphere and model.
Can we make it faster? Ideas?

aligned with x, y, z axes.
axis-aligned bounding box (AABB)
we need to intersect rays with AABB.

don't check triangles
check triangles
ray
How to intersect a ray with an Axis-Aligned Bounding Box (AABB).

\[ x = O_x + r_x t \]

\[ \vec{x}(t) = \vec{O} + \vec{r}t \]

\[ t_xe = \frac{x_e - O_x}{r_x} \]

\[ t_ye = \frac{y_e - O_y}{r_y} \]

\[ t_{yu} = \frac{y_u - O_y}{r_y} \]

\[ t_{xu} = \frac{x_u - O_x}{r_x} \]
Can we make this better?

bounding volume hierarchy (BVH)
How to build a Bounding Volume Hierarchy (BVH).

**Input:** array of objects

Array of Triangle.

(has AABB).

1) pick some axis to split objects

2) sort objects along this axis

3) assign first half of objects to left node

assign second half of objects to right node

(build tree recursively).