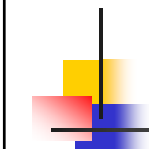


Spatial Subdivision

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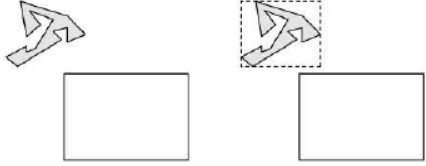
Spatial Subdivision

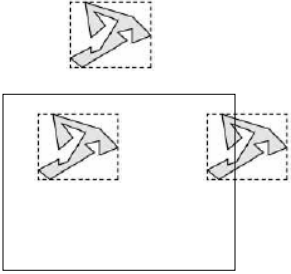
- Can be used for both image space and object space culling
- Based on bounding boxes or volumes

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Bounding Boxes and Volumes

- Polygon clipping is overkill if entire polygon outside the window
- Maintain a bounding box
 - Axis-aligned
- Can be a big savings
- Can be easily extended to 3D
 - For volumes in object-space

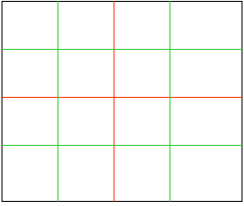




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Hierarchical Spatial Subdivision (2D)

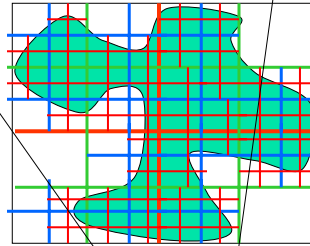
- Quadtree
 - Each node corresponds to a BB
 - It holds the indices of all primitives in that box
 - Divide each box into four equal sized boxes
 - Four children per node
 - Can be computed from BB of parent
 - BB stored only at root



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Hierarchical Spatial Subdivision (2D)

- Tree building
- View Frustum Culling
 - Depth first traversal of nodes
 - If BB inside the view frustum
 - Draw all triangles
 - If BB outside the view frustum
 - Draw nothing
 - If BB intersects the view frustum
 - Go through the children recursively
 - Creates tree cuts



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Extending to 3D

- Cubes instead of boxes
- Octree
 - Eight children
 - Divide in three directions
- Note that may not be optimal
 - Boxes may not be the tightest fit
 - Can have another tree with smaller depth
- Very efficient
 - Since child BB computation is trivial

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Slide 6