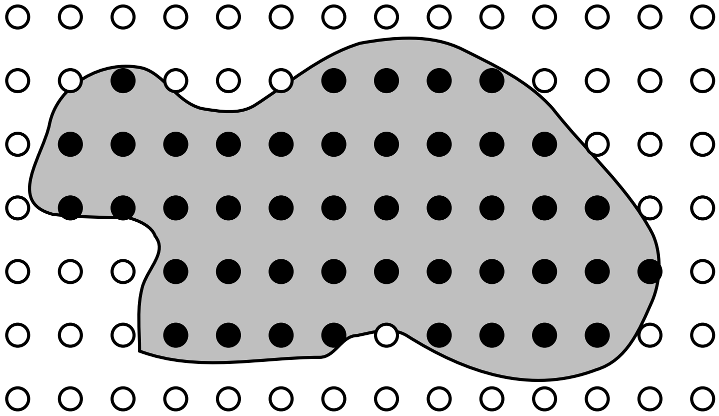
Rasterization

"Enumerate all image elements
corresponding to an object"

(Scan Conversion)



Geometry

- Type
  - Curve
  - Area
- Dimension
  - 2D
  - 3D (projection)

Sampling

- Discretization
- Simple Solution
  - Point Sampling
  - Uniform
- Aliasing

Types of Methods

- Incremental
- Subdivision
- Test

Incremental Method

compute start values and increments

for all spans

  for all pixels in span

    enumerate pixel

    increment pixel

  increment span

Subdivision Method

```
insert object in active list

for all scan lines
    while object in list
        if object is flat
            enumerate object
        else
            split object
            bound parts
        eliminate objects
        sort objects
```

Test Method

```
compute bounding box

for all y
    for all x
        if pixel is contained
            enumerate pixel
```

Rasterization of Lines (Examples)

- Incremental
  - DDA
  - Bresenhan's Algorithm
- Subdivision
- Test

Rasterization of Polygons

- Cases
  - Triangles
  - Generic
    - N-sided
    - convex or not

Incremental Algorithms
Polygons

- Problems
  - Sort Edges
  - Maintain Active Edge List
    - Insert
    - Increment
    - Remove
  - Build and Sort Span List