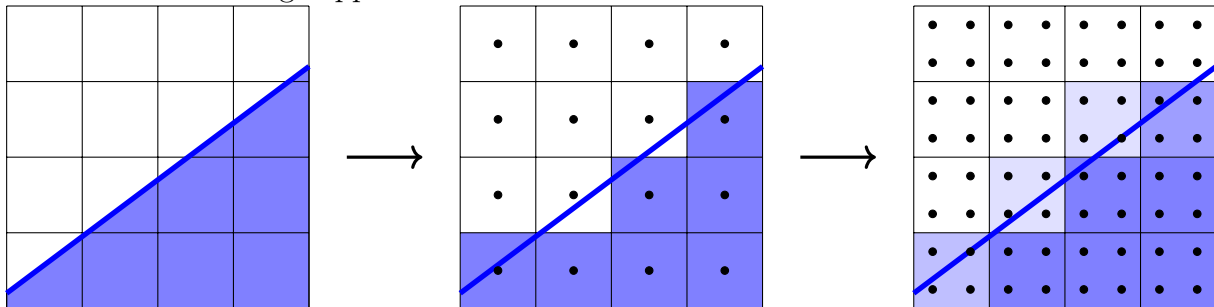


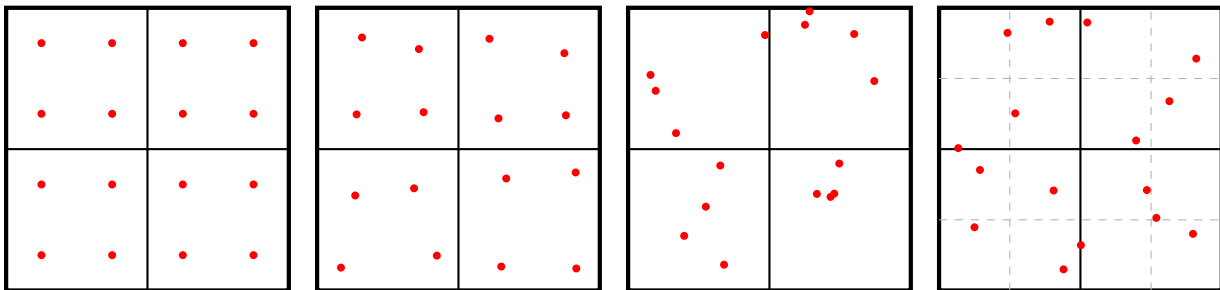
# Ray Tracing: Reflection and Antialiasing

## 1 Antialiasing and Sampling

When we ray trace an object, we cast a ray through the center of each pixel; pixels whose rays hit an object receive the color from the object. This leads to jagged edges on objects. We can avoid this by casting multiple rays per pixel and averaging their results. This causes the object to have a fuzzy boundary, which our vision system generally finds more appealing. It also makes the edge appear smoother.



### 1.1 Sampling Strategies



- Uniform supersampling can still create patterns due to regular spacing.
- Jittering the samples helps break up the patterns by introducing randomness.
- Uniform random seeding within a pixel completely eliminates the patterns, but uniform samples tend to clump.
- Uniform random on a finer grid strikes a compromise, limiting the amount of clumping.