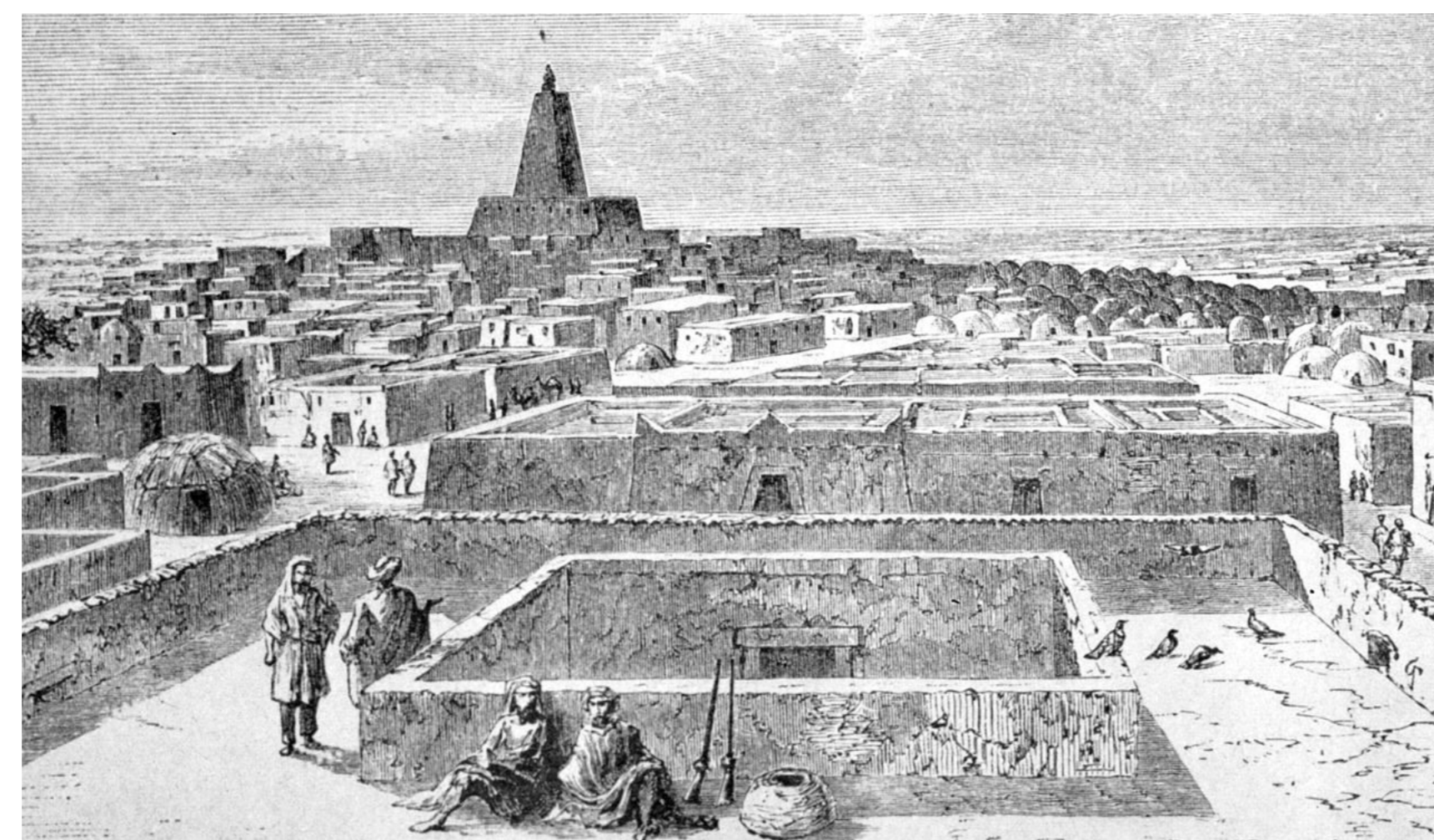


Pictorial Space

Picture A depicts...

- the people in the foreground as sitting down
- the building as being laid out in a grid
- the Djinguereber Mosque as in the background.

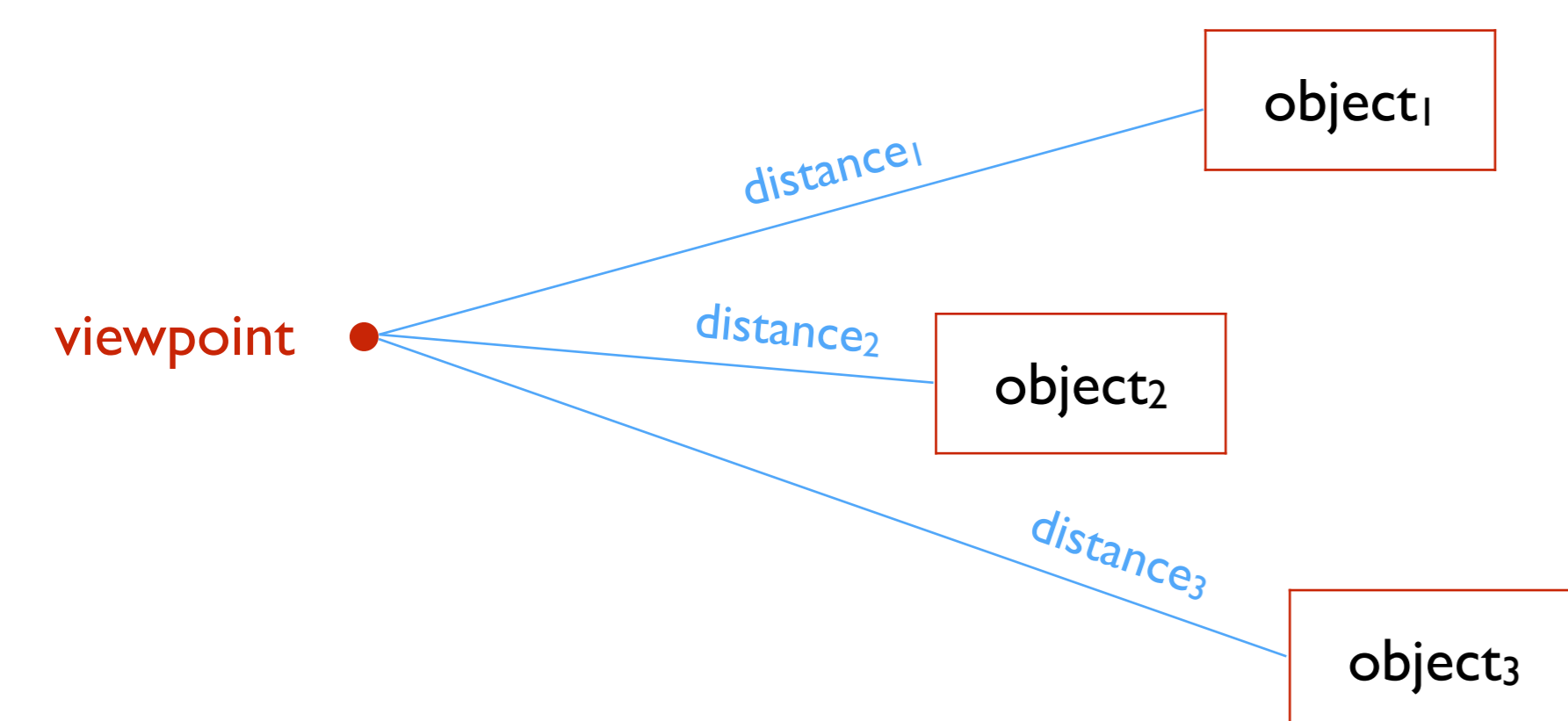


Picture A

No single “depiction as” statement captures the full content of the picture.

Instead we should think of pictures as expressing a kind of viewpoint-centered space, or *pictorial space*.

Pictorial space: an arrangement of objects, properties and relations, located by its position and angle relative to a central viewpoint.



Pictorial space can be contrasted with Cartesian space, where each object is located by its position one two or more metrical dimensions (or axes).

Viewpoint. the concept of viewpoint here is as an abstract oriented location in space. It need not correspond to a real or implied viewer.

Many attributed properties are viewpoint-relative. Examples include:

- relations of relative depth (*further from, closer to*)
- overall angular position in the picture space (*above, below, to the left*)
- outline shape and visible contours (*oval shape*)

Content. My proposal is that we equate pictorial space with pictorial content. Pictures express pictorial spaces as their contents.

Whereas sentences express propositions, pictures express pictorial spaces.

In that case, distinguish *the message a picture is used to convey* from *the content of the picture*. The *message* of the picture may be a simple “depiction as” statement, but the *content* of the picture will always be more rich than that.

Phil 161: Projection Theory

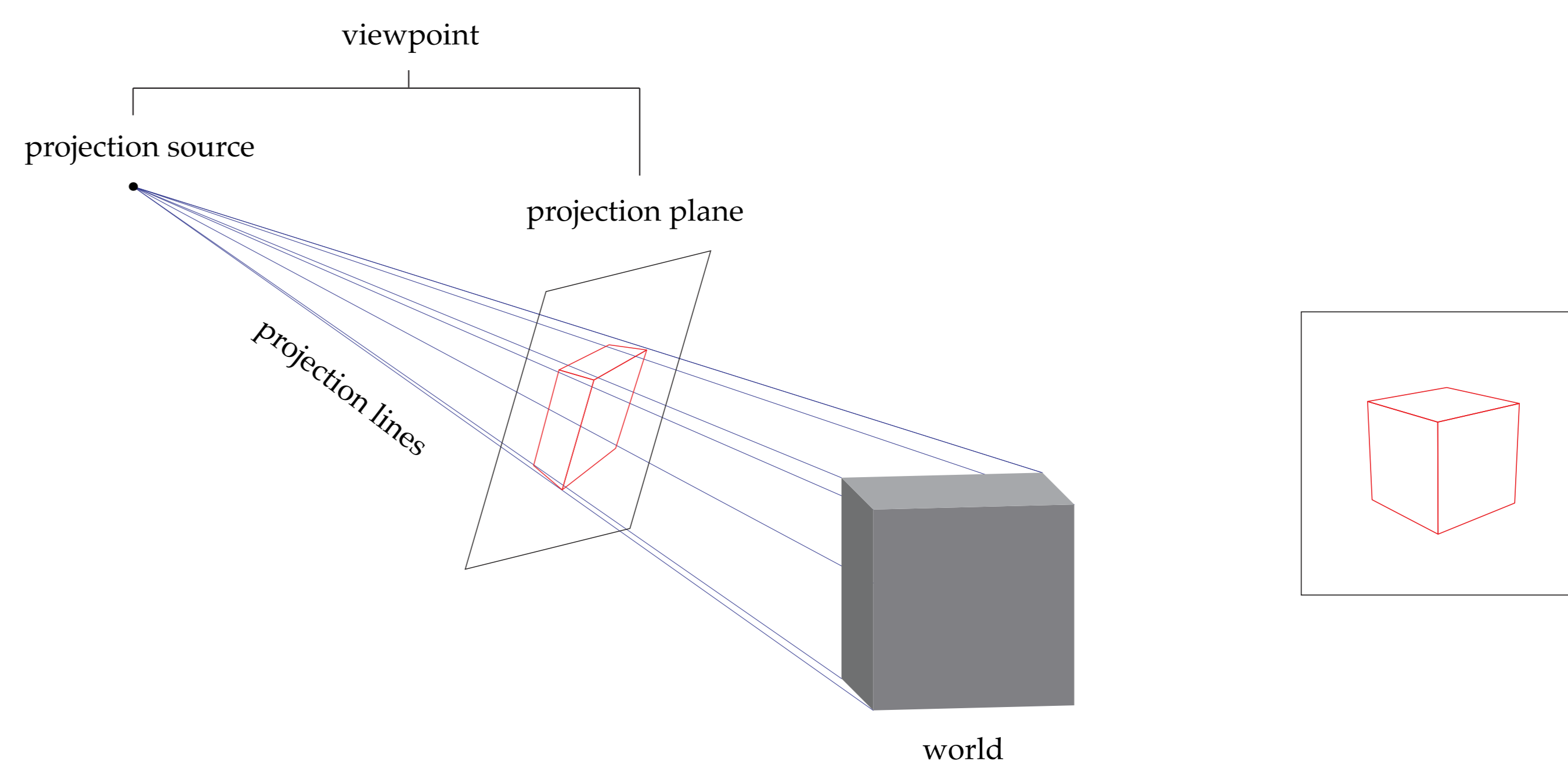
1.27.25 • Prof. G. Greenberg

The Concept of Projection

How can a 2D image to somehow capture the information of a 3D scene? You can imagine various ways of trying to do this, like taking a slice of a 3D scene. But this misses the crucial dimension of depth.

Projection is a more flexible way of deriving a 2D image from a 3D scene. By extending projection in lines into the scene, it carries information from several different planes back to the surface.

Projection is a way of collapsing the depth dimension, while simultaneously transforming physical features into markings.

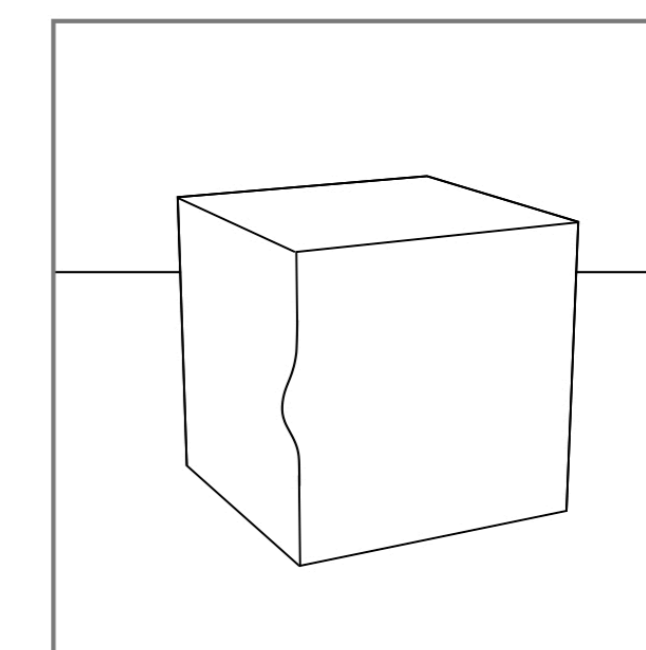


Officially: a projection is method taking (i) a space (or a scene), together with (ii) a viewpoint and deriving (iii) a picture.

Symbolically: $proj(S, V) = P$ where S is a space, v is a viewpoint, and P is a picture.

Projection was discovered by scholars of the Renaissance. Since then it has been thought of as the ideal way of constructing pictures.

It is an *ideal* because not every picture follows it — at risk of inaccuracy.



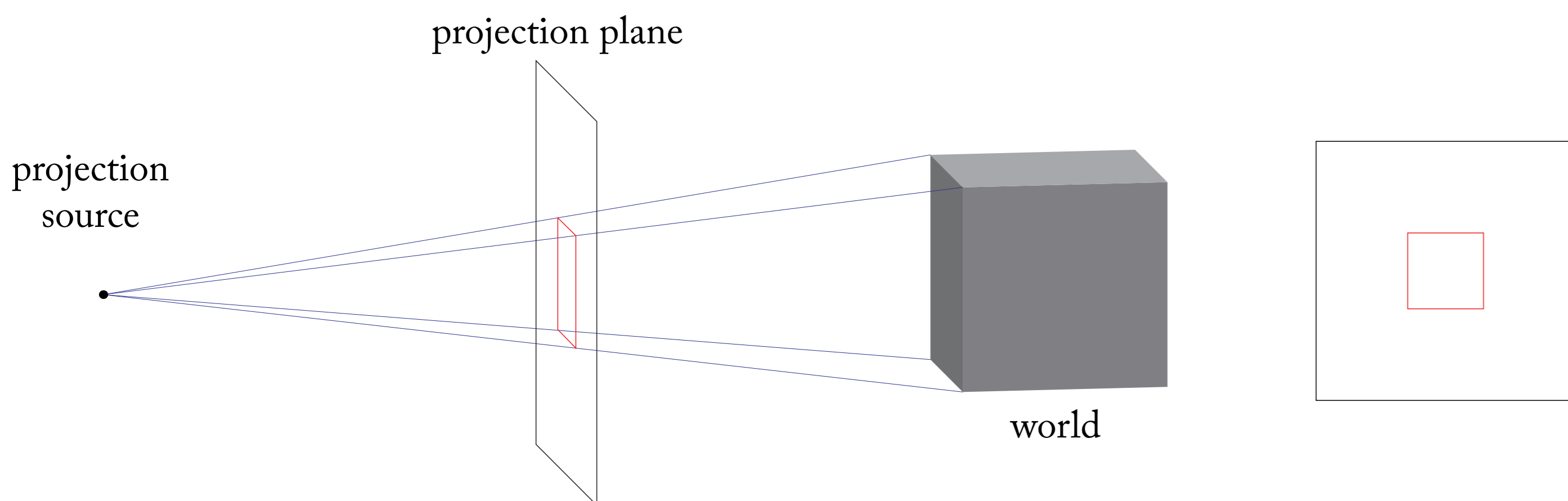
Today projection is the global ideal of image-making: in photography, computer graphics, VR, technical drawing, comics, and art training.

Even when an artist attempts to follow projection, they may fall short of the objective standard.

The Geometry of Projection

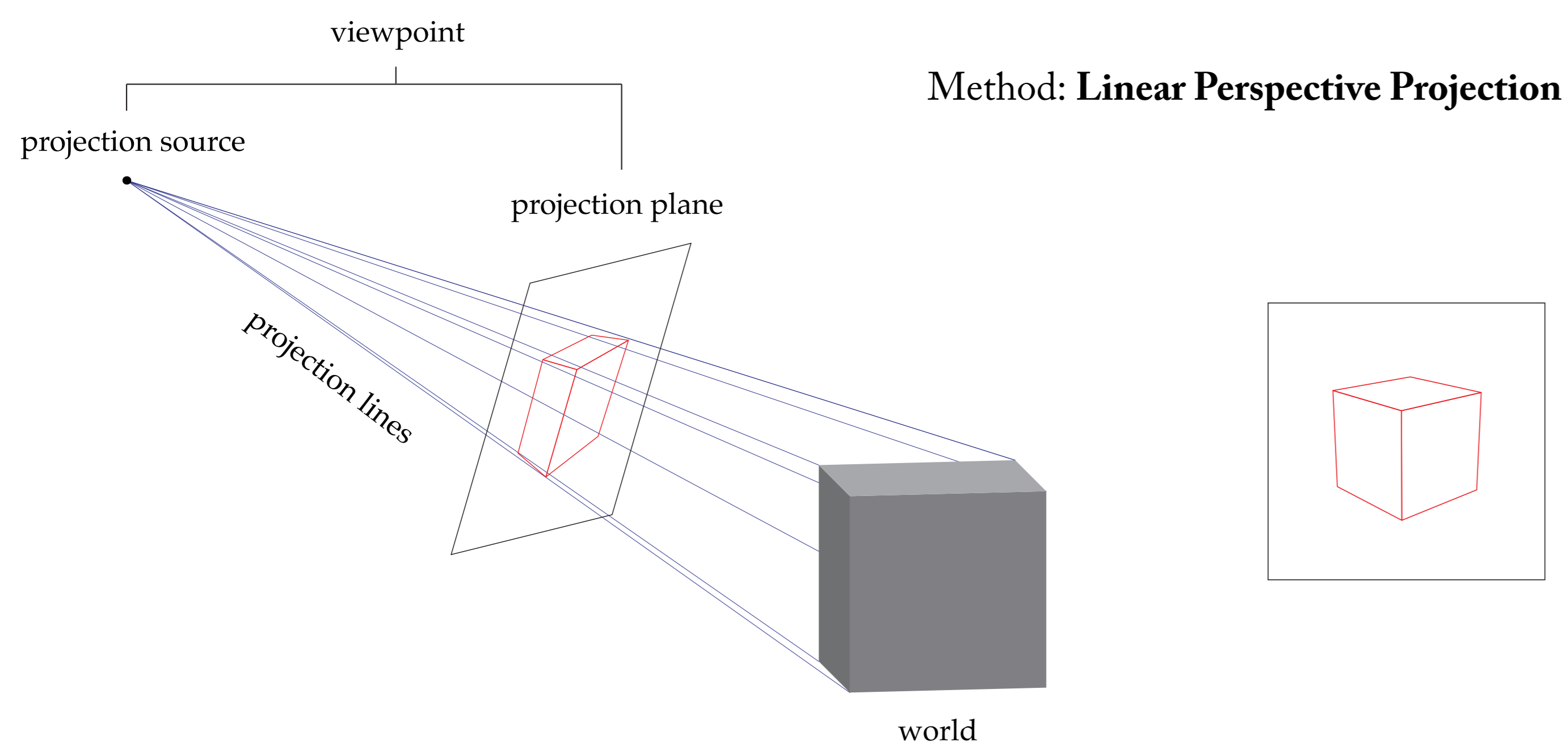
Geometrical Projection describes any one of a family of methods for transposing a three-dimensional scene onto a two-dimensional picture plane via a system of spatial relations established relative to a viewpoint

Projection involves four ingredients: a world (or space), a projection source, and a projection plane, and a method of projection.

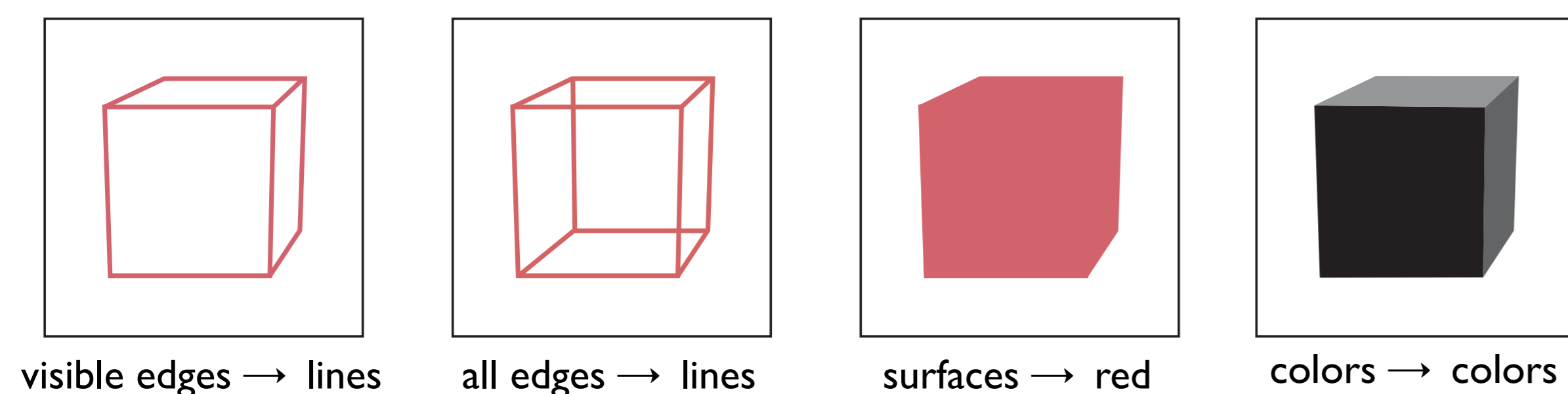


A system of **projection lines** connects the projection source to the world. Features of the world are transposed onto the projection plane

Together the projection source and projection plane define a **viewpoint**. The position of the viewpoint may be varied to reveal additional surfaces.

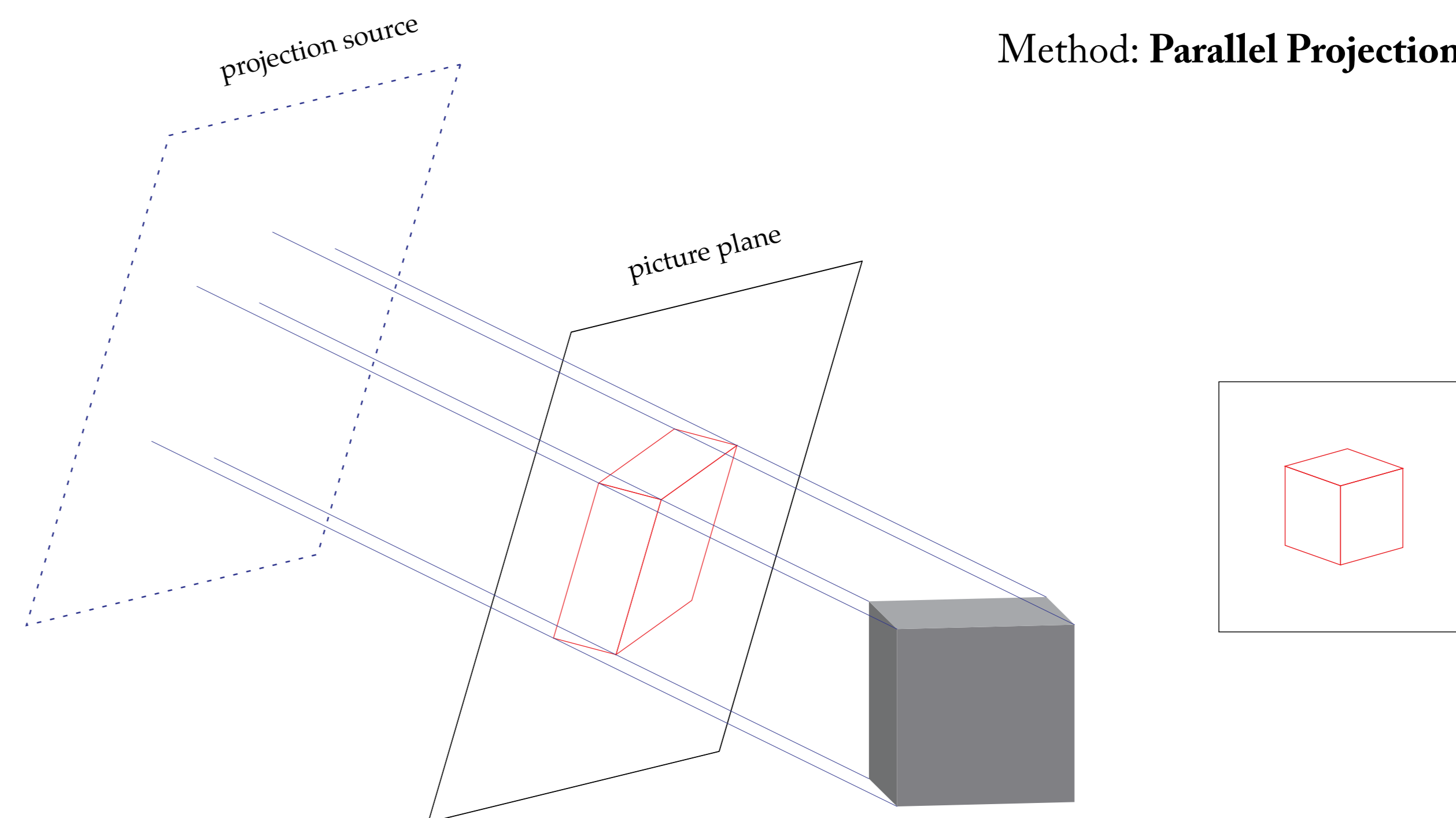


Methods of projection are defined by (i) a **projection condition** and (ii) a **marking condition**. The **marking condition** governs the representation of edges and surfaces:



The **projection condition** governs the overall geometry of the picture:

Method: **Parallel Projection**



The Projection Principle

Projection Principle (accuracy version)

If a picture P accurately depicts a scene S from viewpoint V , then P is a projection of S from V .

Projection Principle (content version)

If a picture P expresses pictorial space C centered at V , then P is a projection of C from V .

Projection theory: virtues

- Reflects artists working practice.
- Captures the objective constraints of resemblance theory...
- But explains how 2D shapes can be related to 3D scenes.
 - Replaces *replication* with *transformation*.
- And allows for variation by system of depiction.

Projection theory: challenges

- Stylization.
- Caricature.
- Inconsistent perspective, e.g. in Medieval art.
- Perceptual effects: the case of peripheral spheres.
- Other cases with perception / psychology seems to play a role.

