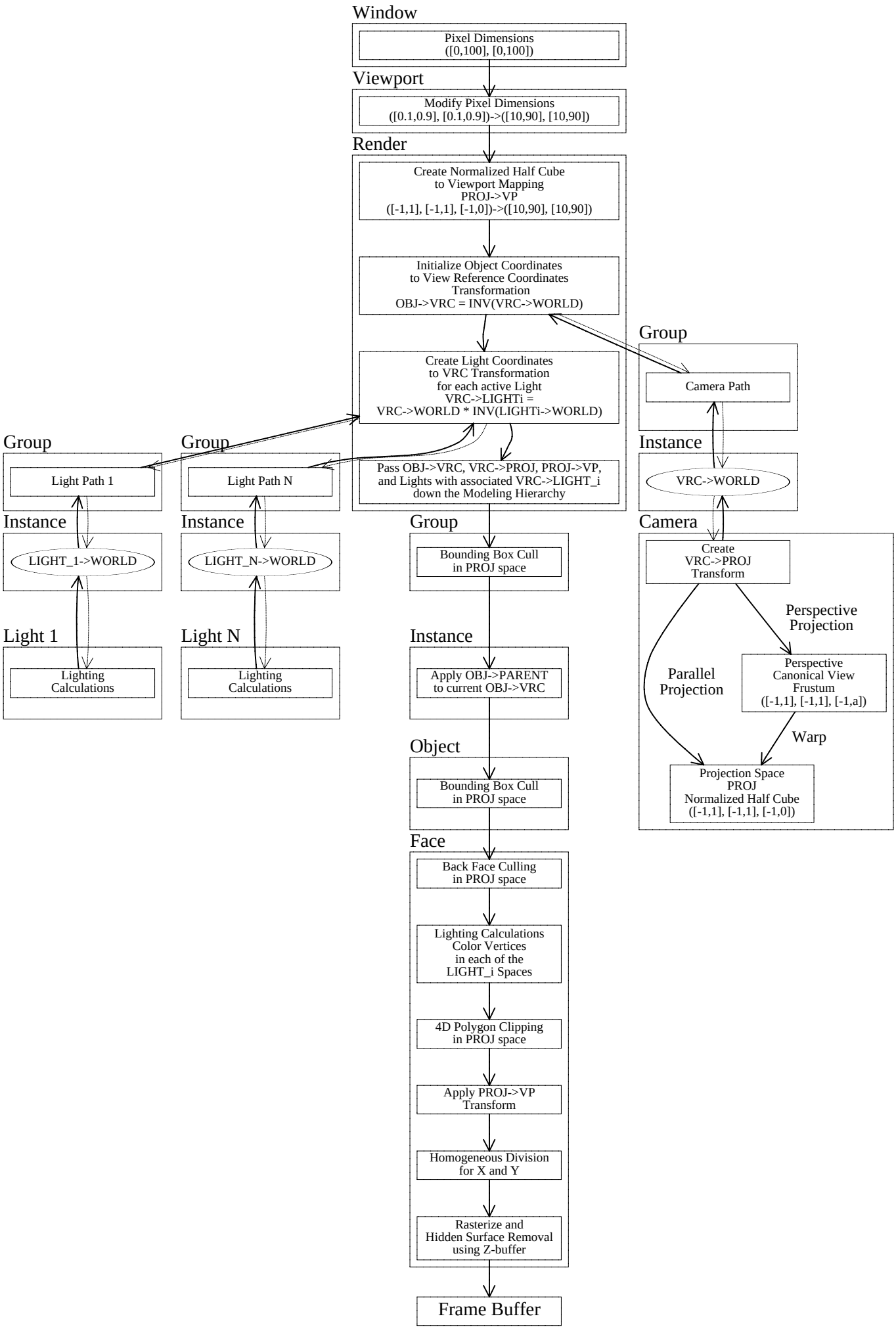
Window
Pixel Dimensions
([0,100], [0,100])
Viewport
Modify Pixel Dimensions
([0.1,0.9], [0.1,0.9])->([10,90], [10,90])
Render
Create Normalized Half Cube
to Viewport Mapping
PROJ->VP
([-1,1], [-1,1], [-1,0])->([10,90], [10,90])
Initialize Object Coordinates
to View Reference Coordinates
Transformation
OBJ->VRC = INV(VRC->WORLD)
Create Light Coordinates
to VRC Transformation
for each active Light
VRC->LIGHTi =
VRC->WORLD * INV(LIGHTi->WORLD)
Pass OBJ->VRC, VRC->PROJ, PROJ->VP,
and Lights with associated VRC->LIGHT_i
down the Modeling Hierarchy
Group
Camera Path
Instance
VRC->WORLD
Camera
Create
VRC->PROJ
Transform
Perspective
Projection
Parallel
Projection
Perspective
Canonical View
Frustum
([-1,1], [-1,1], [-1,a])
Warp
Projection Space
PROJ
Normalized Half Cube
([-1,1], [-1,1], [-1,0])
Group
Light Path 1
Instance
LIGHT_1->WORLD
Light 1
Lighting
Calculations
Group
Light Path N
Instance
LIGHT_N->WORLD
Light N
Lighting
Calculations
Group
Bounding Box Cull
in PROJ space
Instance
Apply OBJ->PARENT
to current OBJ->VRC
Object
Bounding Box Cull
in PROJ space
Face
Back Face Culling
in PROJ space
Lighting Calculations
Color Vertices
in each of the
LIGHT_i Spaces
4D Polygon Clipping
in PROJ space
Apply PROJ->VP
Transform
Homogeneous Division
for X and Y
Rasterize and
Hidden Surface Removal
using Z-buffer
Frame Buffer