

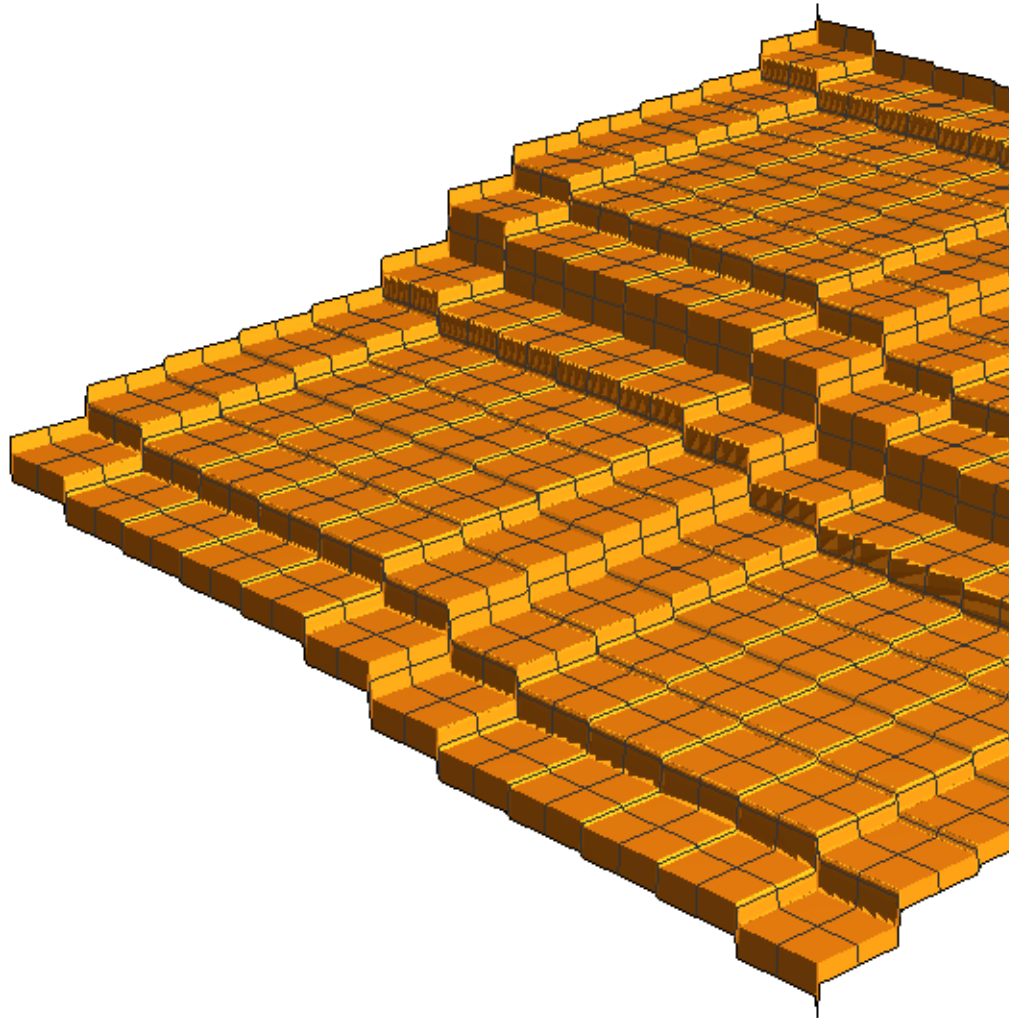
Hilbert's 13th Problem

Pensieve Header: Hilbert's 13th problem - Step 2 (2014 Branch).

```
SetDirectory["C:/drorbn/AcademicPensieve/2014-11/H13/"];  
<< "../..//2009-11/Hilbert13th-Program.m"  
  
 $\phi 1 := \text{Phi}[\text{Identity}, 2, 0.3, 2/3];$   
 $\phi 2 := \text{Phi}[\phi 1, 12, 0, 0.95];$ 
```

```
Timing[
  Step2Cascade = Rasterize[
    Plot3D[ $\phi_2[x] + \lambda * \phi_2[y]$ , {x, 0, 1}, {y, 0, 1},
      PlotPoints  $\rightarrow$  479, Mesh  $\rightarrow$  23, ViewPoint  $\rightarrow$  {-2, -2, 1},
      NormalsFunction  $\rightarrow$  None, Boxed  $\rightarrow$  False, Axes  $\rightarrow$  None,
      ColorFunction  $\rightarrow$  Automatic, ColorFunctionScaling  $\rightarrow$  True
    ]
  ]
]
```

```
{138.513288,
```



```
Export[
  "Step2Cascade.png",
  ImageCrop[Step2Cascade]
]
Step2Cascade.png
```

```
phi1 := Phi[Identity, 2, 0.3, 2/3];
phi2 := Phi[phi1, 12, 0, 0.8];
phi3 := Phi[phi, phi0 -> phi1, Subdivisions -> 12, Slope -> 0, FillFactor -> 0.8];
g1 = G[f, phi1];
g2 = G[f, phi2];

Timing[
  Step2CascadeWithG2 = Rasterize[
    Plot3D[phi2[x] + lambda*phi2[y], {x, 0, 1}, {y, 0, 1},
      PlotPoints -> 2399, Mesh -> 11, ViewPoint -> {-2, -2, 1},
      NormalsFunction -> None, ColorFunction -> (Hue[g2[#3]] &),
      ImageSize -> 3200, Axes -> None, Boxed -> False
    ], ImageSize -> 3200, RasterSize -> 3200
  ]
]

Export[
  "Step2CascadeWithG2.png",
  Step2CascadeWithG2
]
```