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(* Random Planes Passing Through a Schrödinger Cube *)
(* Copyright May 2, 2006,
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(* Allow 2 minutes to run *)
(* Every run is different; use screen capture program for images *)

planepoint = {Random[Real, {0, 1}, 3], Random[Real, {0, 1}, 3], Random[Real, {0, 1}, 3]}
normalvector =
  {Random[Real, {0, 1}, 3], Random[Real, {0, 1}, 3], Random[Real, {0, 1}, 3]}
(*solve p.v=0 *)
normalvector[[1]]
normalvector[[2]]
normalvector[[3]]

(* XY Plane *)
x = .; y = .; xyplane = {};
For[i = 1, i ≤ 100, i++, y = i/100.; For[j = 1, j ≤ 100, j++, x = j/100.; z = .;
  z = z /. Flatten[Solve[planepoint.{(x - normalvector[[1]]), (y - normalvector[[2]]),
    (z - normalvector[[3]])} = 0.]]; xyplane = Join[xyplane, {x, y, z}]];
xyplane = Partition[xyplane, 3];
xyplane = Partition[xyplane, 100];
For[i = 1, i ≤ 100, i++,
  For[j = 1, j ≤ 100, j++, If[0. > xyplane[[i, j, 1]] || xyplane[[i, j, 1]] > 1. ||
    0. > xyplane[[i, j, 2]] || xyplane[[i, j, 2]] > 1. || 0. > xyplane[[i, j, 3]] ||
    xyplane[[i, j, 3]] > 1., xyplane[[i, j, All]] = 0.]]

(* XZ Plane *)
x = .; z = .; xzplane = {};
For[i = 1, i ≤ 100, i++, z = i/100.; For[j = 1, j ≤ 100, j++, x = j/100.; y = .;
  y = y /. Flatten[Solve[planepoint.{(x - normalvector[[1]]), (y - normalvector[[2]]),
    (z - normalvector[[3]])} = 0.]]; xzplane = Join[xzplane, {x, y, z}]];
xzplane = Partition[xzplane, 3];
xzplane = Partition[xzplane, 100];
For[i = 1, i ≤ 100, i++,
  For[j = 1, j ≤ 100, j++, If[0. > xzplane[[i, j, 1]] || xzplane[[i, j, 1]] > 1. ||
    0. > xzplane[[i, j, 2]] || xzplane[[i, j, 2]] > 1. || 0. > xzplane[[i, j, 3]] ||
    xzplane[[i, j, 3]] > 1., xzplane[[i, j, All]] = 0.]]

(* YZ Plane *)
y = .; z = .; yzplane = {};
For[i = 1, i ≤ 100, i++, z = i/100.; For[j = 1, j ≤ 100, j++, y = j/100.; x = .;
  x = x /. Flatten[Solve[planepoint.{(x - normalvector[[1]]), (y - normalvector[[2]]),
    (z - normalvector[[3]])} = 0.]]; yzplane = Join[yzplane, {x, y, z}]];
yzplane = Partition[yzplane, 3];
yzplane = Partition[yzplane, 100];
For[i = 1, i ≤ 100, i++,
  For[j = 1, j ≤ 100, j++, If[0. > yzplane[[i, j, 1]] || yzplane[[i, j, 1]] > 1. ||
    0. > yzplane[[i, j, 2]] || yzplane[[i, j, 2]] > 1. || 0. > yzplane[[i, j, 3]] ||
    yzplane[[i, j, 3]] > 1., yzplane[[i, j, All]] = 0.]]

pointvector = Join[planepoint, normalvector];
pointvectorgraphics = Graphics[Text[StyleForm[MatrixForm[pointvector],
  FontSize → 14, FontWeight → "Bold"], {.5, 1}, {0, 0}]];

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xyg = Graphics[RasterArray[Apply[RGBColor, xyplane, {2}]],  
  AspectRatio → Automatic, ImageSize → {400, 400}];  
xzg = Graphics[RasterArray[Apply[RGBColor, xzplane, {2}]],  
  AspectRatio → Automatic, ImageSize → {400, 400}];  
yzy = Graphics[RasterArray[Apply[RGBColor, yzplane, {2}]],  
  AspectRatio → Automatic, ImageSize → {400, 400}];  
Show[GraphicsArray[{{xyg, pointvectorgraphics}, {xzg, yzy}},  
  GraphicsSpacing → -0.05, AspectRatio → Automatic, ImageSize → {400, 400}]]
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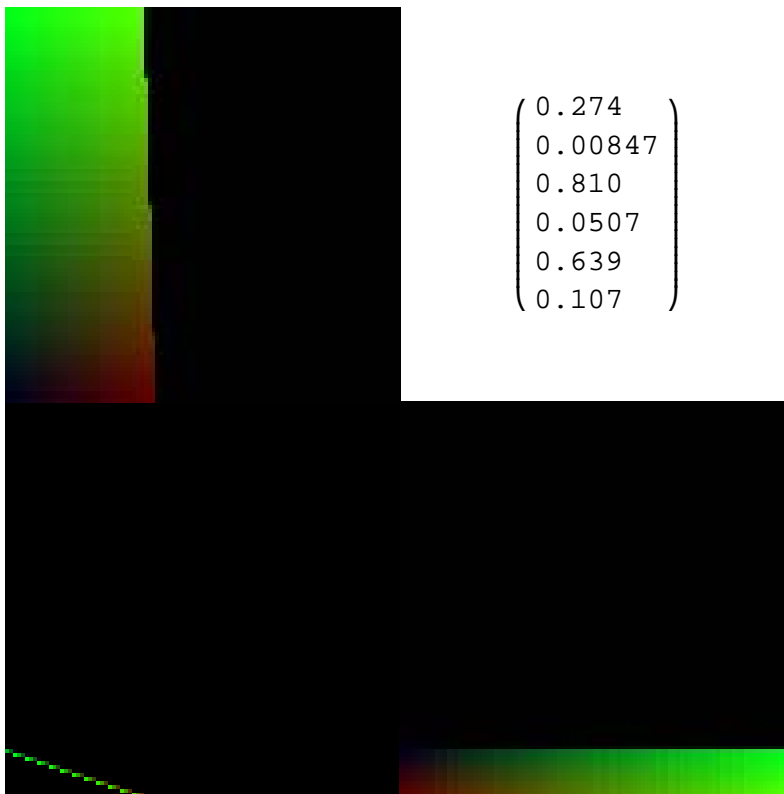
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{0.274, 0.00847, 0.810}
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{0.0507, 0.639, 0.107}
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0.0507
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0.639
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0.107
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- GraphicsArray -
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