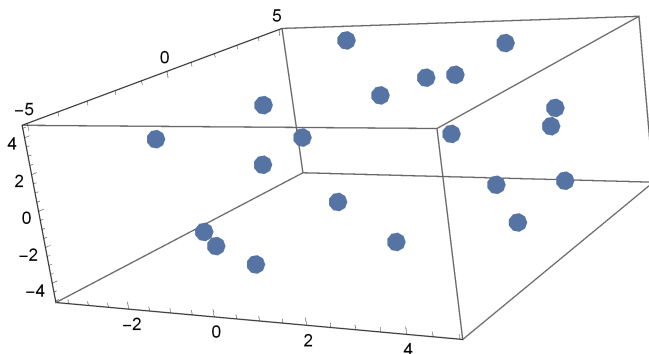


B-Splines

```
(*Choose number of guide points*)
n = 20;
points = Table[
  {RandomReal[{-5, 5}], RandomReal[{-5, 5}], RandomReal[{-5, 5}]}, {i, 1, n}];
ListPointPlot3D[points, PlotStyle -> PointSize[0.03]]
(*B-Spline basis polynomials.*)
p1[x_] :=  $\frac{1}{6} * (-x^3 + 3 * x^2 - 3 * x + 1)$ ;
p2[x_] :=  $\frac{1}{6} * (3 * x^3 - 6 * x^2 + 4)$ ;
p3[x_] :=  $\frac{1}{6} * (-3 * x^3 + 3 * x^2 + 3 * x + 1)$ ;
p4[x_] :=  $\frac{1}{6} * (x^3)$ ;
```



```
splineList = {};
For[i = 1, i ≤ n - 3, i++,

  spline = Sum[pj[t] * points[[j - 1 + i]], {j, 1, 4}];
  AppendTo[splineList, spline];

]
splinePlot =
  ParametricPlot3D[splineList, {t, 0, 1}, AxesOrigin -> {0, 0}, PlotRange -> All]
Show[splinePlot, ListPointPlot3D[points, PlotStyle -> PointSize[0.03]],
  PlotRange -> All]
```

