

Geometric probabilities

Christoph Thäle

Geometry is one of the oldest branches of mathematics and also the very first problems of probability were influenced strongly by questions having a geometric flavour. Whereas it is simple to define what finite set of n (uniformly) random points in a convex body K is, it can be rather difficult to investigate the geometric patterns determined by them. Even in the very simple case $n = 2$ for example it is by no means obvious on how the geometry of the underlying body influences the mean length of the line segment connecting two random points in K . We will investigate this particular problem in detail and see how geometry and probability complement each other perfectly. We will also have a closer look at more complex random polytopes, defined as the convex hull of the n random points in K , and see how very simple and innocent questions about them can bring us to the boundary of current mathematical knowledge.