Random Fractal Models

Brownian Motion

Over a time interval T, the values Y tend to jump by $|Y| = T^{1/2}$

- individual jumps are independent of one another (the future is decoupled from the past)
- The size of jumps is governed by the bell curve (normal, or Gaussian, distribution)

Fractional Brownian motion (FBM)

$$|Y| = T^H, \quad 0 < H < 1$$

small H gives rough graph, anti-persistent fBM

large H gives a smooth graph, persistent fBM

The dimension of the graph is about $2-H$

- the past and future are coupled
- jumps are governed by the bell curve.

Levy Flights

- jumps are governed by a power law
- past and future are uncoupled