

Convex minorants of random walks and Lévy processes

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Maxima or minima of random walks and Lévy processes are fundamental quantities in probability and statistics. They can be simulated by the expensive method of obtaining them from the whole sample path. In this work, we construct the extremes by using a uniform stick-breaking process and random walk increments. This procedure does not use the whole sample path and is very well adapted to the simulation of extremes of stable Lévy processes. Our method actually obtains the greatest convex function below the sample path of our stochastic process (the convex minorant) from which the values of extremes and their positions on the random walk path can be easily read off.

Key Words: Uniform stick-breaking, Extreme values, stable processes