

Three-Dimensional Brownian Motion and the Golden Ratio Rule

(Plenary Lecture)

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(joint work with K. Glover and H. Hulley)

We show that the first time at which the excursion of the radial part of three-dimensional Brownian motion away from its running minimum and the running minimum itself form the golden ratio is as close as possible to the time of the ultimate minimum in a normalised mean deviation sense. Among other things this offers a rigorous optimality argument for the choice of the golden retracement in technical analysis of asset prices.

MSC2010: Primary 60G40, 60J60, 60J65. Secondary 34A34, 49J40, 60G44.

Keywords: Optimal prediction, Brownian motion, golden ratio.

Section: Probability and Statistics.