

French Physicists Calculate Mean First Passage Time

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Predicting FTP in Complex Models

First Passage Time, (FTP) can best be understood by pondering the question, "How long does it take a random walker to reach a given target?" The FTP is key to predicting the spread of disease, neuron firing dynamics and more.

Physicists at the University of Pierre & Marie Curie Physiques Laboratory in Paris have developed a general theory that allows accurate evaluation of the mean First Passage Time, (FTP) in complex media. The lead scientist, S. Condamin, O. Benichou, V. Trejedor, and R. Voituriez in Paris combined efforts with J. Klafter of Tel Aviv University in Israel to accurately assess FTP in complex situations, heretofore the calculation was based on one dimensional geometries or to higher spatial dimensions in homogeneous media.

The importance of calculating FTP can best be understood as pondering

the question, "How long does it take a random walker to reach a given target." The FTP is critical in assessing and predicting spreading of disease, neuron firing dynamics, and transport of disordered media. Over the past decades scientists from various disciplines have studied and researched the predictability of FTP .

The title of the Letter report is entitled, *First Passage Times in Complex Scale Invariant Media* was published in *Nature* 450, at pages 77-80 on November 1, 2007. The scientists state that they have developed an analytical approach that provides a universal scaling dependence of the mean FTP on both the volume of the confining domain and the source-target distance.

The scientists have performed various numerical simulation tests for representative models of disordered media, fractals, anomalous diffusion, and scale-free networks. The results of their research is applicable to a broad range of stochastic processes characterized by length, scale invariant properties.

Further information and request for materials may be directed to Dr. O. Benichou at [benichou \(at\)lptmc.jussieu.fr](mailto:benichou (at)lptmc.jussieu.fr).

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