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Research field: Probability and Statistics

Keywords: random walk, Brownian motion, local time, intersection

Present research:

I am currently conducting research on various problems related to probability theory. Recently, I have been particularly focused on problems involving random walk intersections and local time.

The intersection of random walks, in simple terms, refers to the event where two independent random walks intersect on an integer lattice. This problem is related to harmonic analysis and has a very beautiful analogy. Additionally, probability models related to random walk intersections (such as loop-erased random walks and self-avoiding walks) are also very interesting subjects of study.

To help visualize the research, let's consider a simpler problem setting. In your probability theory courses, you have likely studied limit theorems such as the Law of Large Numbers and the Central Limit Theorem. These theorems typically assume that the sum involves independent and identically distributed (i.i.d.) random variables. One key question in probability theory research is whether limit theorems hold when this assumption is relaxed, and when dealing with other types of stochastic processes.

In fact, the validity of the theorem depends on the dimension, and the fascinating aspect of random walks and similar stochastic processes is that they can undergo phase transitions depending on the dimension.

Notice for the students:

A good understanding of undergraduate-level probability theory and measure theory is important. You don't need to be perfect, so let's review these topics through the upcoming seminars. During the seminar reading sessions, there's no need to rush ahead. Focus on fully understanding the context and filling in any gaps. Making mistakes during the seminar is definitely not something to be embarrassed about; in fact, it's an important part of the learning process. I encourage you to actively participate in discussions and share your thoughts.

Also, for those aiming for a doctoral program, I hope you'll maintain a broad perspective rather than getting too attached to your own research topic. Be sure to actively engage with researchers both domestically and internationally.