TIFR Centre for Interdisciplinary Sciences, Narsingi, Hyderabad 500075

Seminar

Exact distributions of the number of distinct and common sites visited by N independent random walkers.

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Abstract: We study the number of distinct sites $S_N(t)$ and common sites $W_N(t)$ visited by N independent one dimensional random walkers, all starting at the origin, after t time steps. We show that these two random variables can be mapped onto extreme value quantities associated to N independent random walkers. Using this mapping, we compute exactly their probability distributions $P^d_N(S,t)$ and $P^d_N(W,t)$ for any value of N in the limit of large time t, where the random walkers can be described by Brownian motions. In the large N limit one that $S_N/\sqrt{t} \propto 2\sqrt{\log N} + \frac{\tilde{s}}{2\sqrt{\log N}}$ and $W_N/\sqrt{t} \propto \frac{\tilde{w}}{N}$ where $\tilde{s}$ and $\tilde{w}$ are random variables whose probability density functions (pdfs) are computed exactly and are found to be non-trivial. We verify our results through direct numerical simulations.

***Date*: Monday, Aug 12th 2013**
***Time*: 11:30AM (Tea/Coffee at 11:15AM)**
***Venue*: Conference Hall, TCIS**

All are cordially invited