Hari Sahasrabuddhe Lecture Series on Inflections in Computing

Department of Computer Science & Engineering

IIT Kanpur

Talks:
Oct 7 @ IISc Bangalore
Oct 9 @ IITK

Title: Physarum Computations

Physarum is a slime mold. It was observed over the past 10 years that the mold is able to solve shortest path problems and to construct good Steiner networks (Nakagaki-Yamada-Toth, Tero-Takagi-etal). In a nutshell, the shortest path experiment is as follows: A maze is built and the mold is made to cover the entire maze. Food is then provided at two positions and the evolution of the slime is observed. Over time, the slime retracts to the shortest path connecting the two food sources. A video showing the wet-lab experiment can be found at
http://www.youtube.com/watch?v=tLO2n3YMcXw&t=4m43s

A mathematical model of the slime's dynamic behaviour was proposed in 2007 by Tero-Kobayashi-Nakagaki. Extensive computer simulations of the mathematical model confirm the experimental findings. For the edges on the shortest path, the diameter converges to a fixed value, and for the edges off the shortest path, the diameter converges to zero. We review the wet-lab and computer experiments and provide a proof for these experimental findings. We also suggest avenues for further work. The talk is based on joint work with Vincenzo Bonifaci (Rome) and Girish Varma (TIFR).

KURT MEHLHORN

Max Planck Institute for Informatics

Kurt Mehlhorn is a Director of the MPI for Informatics and Professor of Computer Science at Saarland University. He heads the algorithms and complexity group at the MPI.

Kurt is one of the leading proponents of making algorithms useful. He co-created LEDA software library containing optimized implementations of a number of algorithms. The library is widely used all over the world. He has co-authored around 200 papers, and graduated around 50 students.

Kurt has received several awards and honors including Honorary Doctorates from Magdeburg, Waterloo and Aarhus universities, Leibniz Award, Karl Heinz Beckurts Award, Konrad Zuse Medal, EATCS Award and the ACM Paris Kanellakis Theory and Practice Award. He is an ACM fellow, member of the German Academy of Sciences, and the German Academy of Science and Engineering. From 2002 to 2008, he was Vice President of the Max Planck Society.

Designed by: Thinking threads design
www.thinkingthreads.co.in