Turing Centenary Celebration: Abstracts of some talks

9th, 10th Oct. 2012

Prof. Kurt Mehlhorn, 'Physarum Computations'

Abstract:
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 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 behavior 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).

Prof. T V Gopal, Anna University, 'Modelling the human brain: an unorganized machine'

Abstract: This lecture is a quick tour of the attempts at Modeling the Human Brain by Alan M Turing and experts in Artificial Neural Networks, Computational Neurosciences and Consciousness Studies.

Indus Khaitan, Bitzer Mobile, 'Disrupting the classical VPN'

Abstract: The talk would revolve around:
* Product and how we used the available technologies
* Our desire to disrupt the classical VPN and why we think we would be successful
* Creating a product out of an idea and taking it to the market and acquiring customers
* How deep is our technology
* What problem does it solve and what are the alternatives
* What areas did we innovate, what patents have we filed
* What customer pain-points are we solving

Short overview about the technology, product and company: BitzerMobile is building a secure remote access platform for mobile devices, using which enterprise workforce can access their business applications, e-mail, intranet, documents on the go. We have developed a platform from ground-up which replaces the need of classical VPN (Virtual Private Network) for connecting to a remote intranet from iPad, iPhone, Android smartphones and tablets.

What started as a concept built on PKI and SSL to create a secure channel from an app on a smartphone has become a full-fledged product to protect data-at-rest and data-in-transit. The solution has two tangible pieces, viz. one a smart-app which we call a virtual container on the mobile device and second a gateway server which resides in the DMZ (De-Militarized Zone) of the remote intranet. The app encrypts any data which is stored locally and prevents data leakage from inside, while the gateway facilitates the creation of a secure channel for communication.

The product is in deployment stages at two of the largest Fortune 25 companies. BitzerMobile has also raised $4.75m in Venture Capital and has it's R&D in Bangalore and Sales in USA. We have 2 patents pending and around 6 more in exploratory stages.

Nitin Saxena, Hilbert's Entscheidungsproblem: the 10th problem and Turing machines.

Abstract:
On the centenary of Alan Turing (1912-54) we recollect his mathematical work, its historic setting and its effect. He invented the namesake machines to answer David Hilbert's question about decision problems in logic (in german: 'Entscheidungsproblem'). Earlier, at the turn of the century, Hilbert had also challenged mathematicians with several open problems; the tenth of which related to algorithmic solvability of Diophantine equations. In this talk we will sketch how Turing machines led to the (negative) answers to both the Entscheidungsproblem and the 10th Problem.

Dr. Lipika Dey, TCS, 'Social Media Analytics'

Abstract:
For years decision makers had to rely only on business data to derive Business intelligence. This data however did not provide a 360 degree view of the customer. With the consumer-world becoming more internet-savvy, it is possible to derive a more comprehensive picture of the customers. However, the velocity, volume and variety of data that keep on pouring today is mind-boggling. In this presentation we will discuss techniques and technologies deployed by the companies to complement their internal data with information mined from social networks, mobile sensors, and also location-based information from smartphones. This talk will also focus on some of the related issues like dealing with spammers, social-engineers, ghost consumers etc..