The Straits Times

PACIFIC AREA NEWSPAPER OF THE YEAR

SE Review - Tech & Science
HD **Why Hollywood needs maths too**

BY Shobana Kesava
WC 612 words
PD 18 August 2007
SN Straits Times
SC STIMES
LA English
CY (c) 2007 Singapore Press Holdings Limited

LP A mathematician's model is used in everything from movie special effects to police investigations

THE work of two American maths professors is still a powerful imaging tool, after nearly 20 years.

TD Their mathematical model proved a boon with lawmen in the 1992 Los Angeles race-related riots sparked by policemen's assault on black motorist Rodney King.

It helped refine blurred video footage of a rioter's rose tattoo, to the point that the man could be identified.

The complicated theorem, devised in 1988, has time and again proved its versatility - Hollywood, engineers, biologists and multimedia businesses have used the model to produce life-like motions.

A realistic splash in the water when finding Nemo? A jetski leaving little but spray in its wake? The computer program, blandly called the Level Set Method - can do the job.

The brains behind it are Professors Stanley Osher and James Sethian of the University of California, Los Angeles (UCLA).

One of them, Prof Osher, was in town earlier this month to give lectures at the Nanyang Technological University on the model and its applications in image processing.

In a nutshell, the model puts a series of numbers to shapes. Changing the numbers allows the edges or interface between different shapes to be tracked and predicted at a higher dimension than traditional methods allow.

For example, how smoke wafts around an object is essentially one shape splitting, developing holes and then re-forming into a whole.

Maths underpins the details, which is why a high degree of accuracy can be achieved, said Prof Osher, 65, a Fulbright alumnus with a string of honours.

'Hollywood needs mathematicians, or at least computer programmers who can apply maths,' he said.

Prof Tai Xue-Cheng, from NTU's mathematical sciences division, who has been helping hospitals here develop advanced medical imaging, called the work legendary.

'Nearly every issue of top international journals in computer vision and image or signal processing uses the method,' he said.

Prof Osher himself never thought that maths could be a business. The boy from Brooklyn, New York, credited his sister with egging him on to become a maths don as a sure route to middle-class status.

So he became one, obtaining degrees at the Brooklyn College and his doctorate at New York University before starting a teaching career at the State University of New York in 1970. He moved to UCLA in 1977.

Along the way, he also began moving from tutorial classrooms to business boardrooms, as he recognised the effects of applying his mathematics in the real world.

'Applied mathematicians are almost like small businessmen because we deal with government and people from all over the world, so you start running a little operation out of the university...

'Funding, for instance, helps you hire smart people. Almost all my work has been done with other people.'

The first company he co-founded in 1988, Cognitech, assists police with homicide investigations with its video enhancement software. Another is Luminescent Technologies, which develops chips used in semiconductor wafer fabrication.

For Prof Osher, research remains key: 'We do maths for three reasons: ego, money and fun. Fun does it most for me. There's nothing like the thrill of discovery.'

He continues to work hard on technology of the future. 'I'm helping UCLA's brain imaging institution find aneurysms - anomalies in the blood vessels in the brain - and there's real data showing up.'

Prof Tai expects more revolutionising work to come from Prof Osher: 'He's thinking every minute. I've never seen anyone work so hard.'

skesava@sph.com.sg

NS   gsci : Science/Technology | guni : University/College | gcat : Political/General News | gedu : Education

RE   usa : United States | namz : North American Countries/Regions

PUB Singapore Press Holdings Limited

AN   Document STIMES0020070817e38i00048