

THE CAMBRIDGE STATISTICS DISCUSSION GROUP

Wednesday 23rd March 2011 7:15 for 7:45

Amgen Ltd,
Cambridge Science Park,
Milton Road,
Cambridge CB4 0WG

Using spheres to navigate the brain

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Abstract: As well as the familiar *little grey cells* of the cortex, the human brain contains a large quantity of *white matter*. This is made up of millions of myelinated nerve fibres that connect up relatively distant parts of the cortex.

We use the magnetic resonance scanner to produce diffusion weighted images which show how much or little diffusion water molecules undergo locally in specified directions. This information is then integrated to generate a *tractography* which is a model for the directional organisation of these white matter pathways.

The selection of the diffusion directions and the interpretation of the derived diffusivity functions lead to interesting problems of experimental design, signal processing, statistical analysis, and visualisation, on the two-dimensional sphere.

If you want to whet your appetite in advance you can see the video we prepared for the Summer Science Exhibition at the Royal Festival Hall for the celebration of the 350th anniversary of the Royal Society, (<http://www.youtube.com/watch?v=tNB0sM7Jlqg>) and see our DiPy (diffusion imaging in python) software toolbox at <http://dipy.org>

Speaker: Ian was born in Edinburgh in 1944 and raised in Oxford, where he graduated in mathematics. He got higher degrees in Durham (where he met & married Margaret, counsellor and horticulturalist) and London. Ian arrived in Cambridge in 1972 to work for the MRC as a statistical advisor for psychologists and neuroscientists until he retired in 2010. His interests include mathematical and statistical modelling and brain imaging. He also played a role in establishing the Cambridge Statistics Discussion Group. Ian was leader of Cambridge City Council from 2003-2010, and is currently Deputy Mayor.

Directions: Head north on Milton Road. Two traffic lights before the A14 turn left into the Science Park (clearly signposted). Turn left at the roundabout. The meeting takes place at Amgen in the restaurant in building 214 (the ground floor of the middle building on the attached map which is also at <http://imaging.mrc-cbu.cam.ac.uk/statswiki/csdg/amgen>).

Parking is available on site. There will be no admittance after 7-45pm.

Arrivals after 7-45pm can gain admittance by contacting the secretary on 07761769436.

If anyone would like complementary transport to the talk venue from Central Cambridge please inform the secretary in advance of the meeting.

Provisional Next Meetings:

13th April – Shaun Seaman (MRC Biostatistics).

11th October – Andrew Conlan (Cambridge Infectious Diseases Consortium).

Supper: Some members eat regularly in the University Centre before each meeting at 5-45pm. Feel free to join them.

Subscriptions: of 1 pound are now due for attending the 2010-2011 session.

Secretary: Peter Watson, MRC Cognition and Brain Sciences Unit, 15 Chaucer Road, Cambridge CB2 7EF;

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Take a look at our website: <http://www.mrc-cbu.cam.ac.uk/people/peter.watson/csdg.html>