

“The Eyes: Gateway to the Soul?” (Recognising people by their iris patterns)

Dr John Daugman
University of Cambridge

Monday, 24th October, 2005; 7.30 - 9.00 p.m.
The Wolfson Lecture Theatre, Churchill College, Cambridge

Chair: Professor Sir Sam Edwards, FRS
Vote of Thanks: to be announced

About the lecture:

Dr Daugman writes.....

“Iris recognition provides real-time, high confidence identification of humans by mathematical analysis of the random patterns within the iris of an eye. Because the iris is a protected, internal, organ whose random texture is epigenetic and stable over life, it can serve as a living password or passport that one need not remember but is always in one's possession.

Recognition decisions are made with confidence levels high enough to support rapid exhaustive searches through national-sized databases. The principle that underlies these algorithms is the failure of an efficient test of statistical independence involving more than 200 degrees-of-freedom, based on phase sequencing each iris pattern with quadrature 2D wavelets.

Different persons always pass this test of statistical independence, but images from the same iris almost always fail this test of independence. The combinatorial complexity of phase sequences enables operation always in one-to-many "identification" mode, which is more demanding and useful than just one-to-one "verification" mode in which each person must always first assert an identity that is then merely verified.

The benefit is cardless, PIN-less, hands-free identification, with database search speeds of about 1 million persons per second per CPU. The search engine allows parallelisation to national scales, as in the UK ID Cards proposal.

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Data will be presented in this talk from 200 billion iris cross-comparisons between different eyes. The database consisted of 632,500 iris images acquired in the United Arab Emirates, in a national border-crossing security programme that uses the Daugman algorithms for iris recognition.

A total of 152 different nationalities were represented in this database, which is the largest iris database in the world. Statistical analysis of the 200 billion iris cross-comparisons allows conclusions to be drawn about the numerical decision policies that should be implemented in large-scale deployments of these algorithms, for example in the Government's ID Cards proposal."

About the speaker:

John Daugman received his degrees at Harvard University in the USA and was appointed to the Harvard faculty before coming to Cambridge in 1991. He has held visiting Professorships at the University of Groningen (the Johann Bernoulli Chair), and the Tokyo Institute of Technology (the Toshiba Endowed Chair). His current areas of research and teaching are Computer Vision, Statistical Pattern Recognition, Information Theory, and Neural Computing.

Dr Daugman is the inventor of iris recognition - the automatic identification of persons by analysing the patterns visible in the eye's iris from some distance - and his algorithms are the basis for all current deployments of this biometric identification technology. His awards include the US Presidential Young Investigator Award, the Information Technology Award and Medal of the British Computer Society, the "Time 100" Innovators Award, and the OBE.

The CSAAR Organising Secretary adds.....

I've not knowingly been the subject of an iris examination, but I sure it will come; the task of proving that we really are who we claim to be is an unavoidable feature of modern life, I fear.

John Daugman invented the systems whereby a person can be identified by an automatic scan of their iris (another technique uses a scan of the retina - equally unique, I believe).

This is a wonderful lecture to start off our year with! We have a splendid range of lectures for you (although I says it meself, as shouldn't!)

Enjoy!!

About our President:

I am sure you will be delighted to know that our President, Professor Sir Sam Edwards, was awarded the Dirac Medal this year for his outstanding contribution to physics. See http://www.eurekaalert.org/pub_releases/2005-08/asic-idm080805.php for details.

Coffee and biscuits available, as usual, in the foyer outside the lecture theatre from ~7.00 p.m. Once again, we shall be charging non-members a nominal sum for entry.

Richard Freeman
CSAAR Organising Secretary