Embargo Tuesday 29 October 2002
Spy vs Spy: the science of surveillance and security
Session 2: 10.15am Time for the perfect crime

The Science Forums

Presentation: Forensics DNA breakthrough
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Australian Genome Research Facility

- *key words/terms: authenticity, counterfeiting, document trails, DNA fingerprinting, fraud, specificity*
- *applications: law enforcement, legal reform*

What it's worth
Money laundering is estimated to be between two and five percent of the world's gross domestic product. Using 1996 statistics, this is equivalent to 590 billion to 1.5 trillion US dollars.

In addition, after the tragic events of 11 September 2001, a number of governments called for a rapid and co-ordinated effort to:

- detect and prevent the misuse of the world financial system by terrorists.
- criminalise money-laundering activities, and
- confiscate the illegal proceeds of crime.

In most cases legislation seeks to:

- verify authenticity of documents
- verify source of documents, and
- establish and verify document "trails"

of government bonds, securities, contracts, bearable bonds, certificates such as shares etc, wills and probate, government documents, and company documents.

Definitive document security
Clearly, there is a demonstrated need to establish method for definitive document security.

To achieve this we need:

- proof of delivery
- non-repudiation of origin, to verify the origin of document
- non-repudiation of delivery, to verify document delivery
- message sequence integrity, ie document tracing, and
- message origin authentication, to ensure the document is authentic.

It's possible to use the following security measures:

- signature; which can be poor security and easily forged
- physical fingerprint, which can be smudged or changed in someway
- other biometrics such as iris recognition, but this is very difficult to embed into documents, and
- DNA fingerprints.

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At the Australian Genome Research Facility, we have developed a method using the extremely high specificity (billions to 1) of DNA fingerprinting from cells on documents to provide ultimate security. This method, similar to forensics, identifies documents from skin cells left on or within the document.

Advantages of DNA fingerprinting

Advantages include:

- unlike conventional fingerprints, DNA fingerprints cannot be rubbed off, smudged, interfered with, or obscured
- a person cannot erase or alter their DNA fingerprint. Their DNA fingerprint will remain with them throughout life and potentially forever, even after death
- unlike conventional fingerprints, DNA fingerprints cannot be duplicated, manufactured or modified
- every single cell on a person's body contains their unique DNA fingerprint. Person cannot hide.

This technology can identify who touched a document, confirm authenticity and establish document trails.

Profile

Dr Ian Findlay has been Senior Research Fellow at the Australian Genome Research Facility at the University of Queensland since July 1999.
His career highlights include two world-firsts: multiple genetic diagnosis from small numbers of cells in 1994, and the world's first DNA fingerprinting of single cells in 1997.
Dr Findlay gained a BSc at the University of Glasgow in 1987, a PhD at the University of Leeds in 1997, and was awarded Scientist of the Year by the European Society of Human Genetics, in 1998.

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