Making the invisible VISIBLE

From left, Mike Broderick, Dr Dirk Obbink, and Dr Alexander Kovalchuk

Photograph: OMS

Sara Feenan discovers how new scanning technology can reveal hidden secrets

The University of Oxford's classics department has, for the first time in its history, developed a new technology that has been spun out into a new firm.

It gives a portable solution to the analysis of documents, whether it is detecting a forgery in artwork, analysing a piece of forensic evidence, or revealing hidden detail in a historically important document.

Oxford Multi Spectral (OMS) is marketing the technology developed by US born lecturer of papyrology, Dr Dirk Obbink and Ukraine-born physicist Dr Alexander Kovalchuk.

The new equipment is able to scan, restore and archive ancient and significant documents or artwork, as well as analysing security-embedding in bank notes, border documents or a passport.

OMS has been spun-out by Isis Innovations, the technology transfer company of Oxford University, which manages the intellectual property portfolio based on the research coming out of the university.

Dr Obbink, who headed the research team, said: "The technical leaps we made mean many ancient documents that were previously unreadable can now be scanned and read. We can detect an artist or writer's signature under multiple layers of paint or a pencil sketch under a watercolour."

The team took the project to a conference at the British Museum in London, where they were approached by Cambridge-based Mike Broderick.

Mr Broderick has a long career history in imaging and has worked for companies consulting on various types of images from X-rays to art.

The research team at Oxford University and Isis Innovations together with Mr Broderick spent a year working on a business model.

They felt Mr Broderick's experience in the imaging industry and his expertise with consulting, marketing and sales meant he would be best placed to lead the business as chief executive.

OMS has received an investment from a private Chinese investor, Changsha Yaodong Investment Consulting of £250,000. Its UK-based partner RTC Innovations will help to commercialise, manufacture and market the product globally.

The team also received £47,600 from the University Challenge Seed Fund in 2010 for prototyping.

Paul Westwood , managing director of Forensic Document Services, the biggest forensic document company in Asia Pacific, said: "The portable nature of the scanner means it will be a great resource when document examiners are required to undertake examinations out of the laboratory environment."

The A4 size scanner creates a layered image which uses different wavelengths of light (such as ultra-violet or infrared) to reveal hidden details on an object.

Dr Alexander Kovalchuk, the physicist who invented the scanner, explained: "An ordinary colour image has three layers: red, green and blue. A multi-spectral image has many more layers, some of which are invisible to the human eye, but all of these layers contain potentially useful information. Our scanner is capable of registering an unlimited number of layers."

Dr Obbink said: " We can set the equipment to interrogate a feature we are interested in: the surface structures, fibres, stains, watermarks, fingerprints or alterations."

The previous technology used in the university involved a camera on a tripod, a dark room and specific wavelengths of light applied one at a time to reveal any faded or hidden information.

The new technology builds on this by using the design of a normal desktop scanner.

Using the glass plate and lid, which excludes any external light, the multi-spectral sensors move along the document in a similar way to a normal scanner using different wavelengths of light. It can build successive layers of an image, potentially revealing new hidden detail with each repetition.

OMS has developed a machine which can currently analyse a document up to A4 size and is able to cover industries such as research and art, as well as the forensic side of analysing security documents and pieces of evidence at a crime scene.

Mr Westwood said: "We anticipate that using the Oxford scanner will be like moving from working in a dark room to using a modern digital camera.

"We can use it to detect what is currently invisible and make it visible. The compact design and powerful imaging and analysis will be of great benefit to document examiners worldwide."

Isis Innovations works with university researchers on identifying, protecting and marketing technologies through licensing, spin-out company formation and bringing the technology to market.

Since its first spin-out company Oxford Instruments in 1956, Isis Innovations has signed off in excess of 500 license agreements and, since 2000, it has spun-out more than 60 companies.

These range from NaturalMotion, a technology based in real-time character animation which is used in console games such as *Grand Theft Auto IV,* to Intelligent Sustainable Energy, an intelligent energy monitor to help consumers reduce energy bills.

Managing director of Isis Innovations, Tom Hockaday said:" OMS will be the first spin-out from the university's classics department and the humanities division. We are delighted to see the impact of this technology across other disciplines." ib

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Sara Feenan meets an occupational therapist combining advice for new parents with an online children's clothing business

A PERFECT combination?

Becoming a mother for the first time inspired Linn Brynildsen to set up a new business combining her career as a psychologist with her desire to find quality children's clothing.

The result is the Mayamin website where parents can find practical and fashionable Scandinavian clothing while also reading research and advice about their youngsters.

Norwegian-born Ms Brynildsen said: "When you have small children around life can be a bit of a whirlwind and for first-time parents this can be daunting."

Ms Brynildsen has always been passionate about fashion and when her daughter Maya was born, she decided to combine it with her job as a qualified occupational therapist and set up the website.

She found it hard to find credible parenting tips online. so turned to psychology journals and books and decided to share what she had found.

The parenting section of Mayamin is split into sections ranging from sleep to tantrums and tips and advice are categorised by age.

Ms Brynildsen, from Yarnton, would like the site to also act as a support network for parents.

She added: "I welcome comments and would love parents to be able to share stories and enter into a discussion on the site."

Mayamin means 'my dream' in Norwegian as well as including Maya's name.

When her sister started having children ten years ago, she noticed the difference between clothes for children she found in England and the clothing she used to wear growing up in Norway.

In England wool was considered as a material unfriendly to the sensitive skin of children.

"Wool is used more readily in Norway and Scandinavia in general. Many of the clothes I stock use Merino wool, which is a super soft type of sheep wool that absorbs moisture and helps regulate temperature," she said.

Using the right combination for underwear and outer wear to reduce the layers children wear is important, she claims, and she has thoroughly researched the brands she stocks down to details such as zips being placed differently depending on the age of the child.

Ms Brynildsen has found juggling home life with setting up a business means long days and she often works into the night. But a year on from contacting the web-designers Mayamin was launched last month and already Ms Brynildsen is keen to expand the business.

Whether it be her occupational psychology experience in coaching when she worked for OPP in London and Cheltenham-based JCA Occupational Therapy, or her penchant for selecting cute and practical Scandinavian attire for little people, she is excited to see her Maya grow in both senses of the word. ib

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Cakes and kindness

Entrepreneurial duo Linda Williams and Julia Atkinson have found their baking business is just the right recipe for them to balance home and work life.

The pair met seven years ago, when they both had just had their first child and Ms Atkinson was delivering leaflets after developing her love of baking cakes into a micro-business. They became firm friends when they found they were both originally from the north-west of England.

Ms Atkinson used to work as catering manager at St Cross College, Oxford, and always brought cakes to social events, sometimes even sneaking them into cafés.

They were both looking to go back into employment and they were investigating opportunities to balance work and the demands of their growing families without compromising either. Ms Williams, who worked in marketing for 3, the mobile phone company, before leaving her career to have children, realised they could start a business selling Ms Atkinson's cakes to cafés, personalising them for birthdays and arranging corporate contracts.

The result was Happy Cakes based in the kitchen of Ms Atkinson's Summertown home, which, in a neat twist, they have since found was built on the site of the Oliver & Gurden cake manufacturer, which became part of the Lyons Group in 1968.

They worked for two years selling the cakes to cafés and a chain of delicatessens and using leaflet drops to build-up a customer base.Then they decided to set up a website.

"We have never turned down business and we always deliver on time and by hand." said Ms Williams. "Our motto is: cake and kindness go a long way!" ib

Linda Williams and Julia Atkinson presented David Walliams with a box of cup cakes during his marathon Thames swim for Sport Relief last month

Contact: 07908 826946 ■ www.happy-cakes.co.uk