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BAE Systems – increasing collaboration

BAE Systems is the latest company to join the Corporate Liaison Programme. This builds upon multiple research collaborations already established between the company and the University of Cambridge in a variety of fields. In fact, BAE Systems represented the second largest industrial sponsor of research in the aerospace sector within the University in 2002/3.

BAE Systems has been a very strong supporter of University/industry collaborations over the last few years. The company has contributed to a number of government reviews including the Lambert review, works very closely with the EPSRC, and currently holds the chair of ICARG (Inter-Company Academic Relations Group of the CBI). To support their future business capability needs, BAE Systems have an evolving set of cross-disciplinary strategic requirement areas for deeper relationships with universities. Large-scale integrated research programmes, jointly funded with EPSRC, underpin each strategic area.

The Corporate Liaison Office (CLO) is now on hand to help BAE Systems identify new opportunities for collaboration within the University of Cambridge. The CLO seeks to provide a complementary and complete view of the University that enables a company to engage with multiple departments and functions. This support helps to ensure that a company's diverse needs can be fully met.

This relationship with BAE Systems is intended to build on existing collaborations and discussions in areas as diverse as support engineering, aerospace design, image processing, simulation and modelling. For example, BAE Systems has recently entered into an agreement to fund a new post in Support Solutions within the Institute for Manufacturing. This post will conduct research into all aspects of service and support engineering. The University is also working with the human resources and technology centres within BAE Systems to identify new ways of collaborating that will utilise the resources in both organisations in different ways.

Dr John Murphy, Head of BAE Systems University Partnerships, commented 'Our wide product range and global market drives the need for breadth and depth in our research with global awareness. Our approach is to network leading academic teams to address multi-disciplinary challenges at the research stage. Cambridge is a natural partner to help us with in-depth research across our wide science and technology spectrum and support our integrated approach in a global environment.'

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BAE Systems and the University of Cambridge celebrate signing a strategic agreement in support solutions.

Editorial

Many of you will receive this edition of *Insight* as you attend our New Materials for Electronics seminar, which launches the second series of *Horizon* technology events. These seminars have proved very valuable for both the University and its partners, seeding both new engagements and contacts and renewing existing relationships. We hope you enjoy the second year of *Horizon* – you will find a full listing of seminar topics for year two at the back of the magazine.

Global partners work with us, in collaborative projects for mutual benefit, to advance research and discovery. As usual, in *Insight* you'll find practical examples of project opportunities, ranging from licensing opportunities to research projects under way in a diverse spectrum of disciplines: low energy buildings, the 'Digital Orient',

novel methods of high precision materials joining, and models of supplier management – the scope of work in Cambridge is likely to cover most research interests!

Alongside pure research, we work with partners in many others areas of interest key to business and University success. In this issue you'll also find articles on recruitment, running conferences and an example of a not-for-profit community-venturing project.

Finally, we're pleased to welcome BAE Systems as a member of the Corporate Liaison Programme, which we launched in September 2003. We look forward to working with them and with you as future partners in areas that are of particular interest to you – be it research, recruitment, executive education, in the community - or any other project!

Spotlight on: The Careers Service

Cambridge University's Careers Service offers advice and information to all Cambridge students: from all courses, years and Colleges, whatever their interests, ambitions and abilities. Some 14,000 current students and alumni are signed up to the Careers Service website which lists employers' vacancies, events and other material by employment sectors. On average a student visits Stuart House every four minutes, every hour, every day throughout the year.

The Service is in contact with over 1,300 organisations interested in recruiting Cambridge students and alumni for vacation work and more permanent opportunities after graduation. Over 450 employers attend one of a dozen events a year covering finance and law, to the 'more-than-just-profit' sector and media. A weekly vacancy list promotes a great variety of opportunities and the vacancy listing service to employers is entirely free irrespective of the company's size or nature of the vacancy. Unlike commercial recruitment agencies, this allows a wide range of organisations and opportunities to be presented to our students. Examples from just one week's list included:

Committee Specialists for the House of Commons, Trainee Patent Attorneys for a firm of Patent Agents, a User Interface Developer for a software company, a Product Design and Development Manager under the knowledge transfer partnership for Brunel University, Designers and Engineers for a major motor vehicle manufacturer, a Russian-speaking Translator for an organisation monitoring forests and the environment, a Medical Scientist for a pharmaceutical company, postgraduate study opportunities at Cranfield University and the University of Essex and details of a competition offered by the BBC for radio presenters and script writers.

However, not all Cambridge students go into employment immediately on graduating. Surprisingly for some readers perhaps, only half of first degree students go straight into permanent jobs.

“Last year's graduates went into fields ranging from banking through stonemasonry to professional gambling”

Others go into postgraduate study (29%), vocational training (10%) or decide to take a break for a year (5%). These students continue to search the vacancy lists when renewing their job search or changing career. Those that go into employment do so across a wide variety of occupations: they don't all become bankers, lawyers or accountants! Last year Cambridge graduates became stonemasons, civil servants, cameramen, journalists, actors, pilots, farmers, actuaries

and a professional gambler.

If your organisation has any immediate or future graduate level vacancies, the Careers Service would be delighted to publicise them for you free and to offer advice on recruiting at Cambridge. Please contact Gordon Chesterman, the Director, on gc214@cam.ac.uk and visit the website at www.careers.cam.ac.uk



Students meet local employers at the annual 'CAM Connect' event

Cambridge expertise pioneers low-energy building design

The School of Slavonic and East European Studies at University College London was set up in October 1915 to study the nation-states emerging from World War One.

On May 5th 2004, the Polish president Aleksander Kwasniewski unveiled the foundation stone of a new building – using the latest low-energy technology – to house the School’s expansion.

Professor Alan Short, head of architecture at Cambridge University, designed the new building through his practice, Short & Associates. It’s just one example of a major shift in focus for building design at Cambridge and projects in the design of low energy buildings are now in process in collaboration with the BP Institute for Multiphase Flow. This is important because sustainable building design is key to reducing future energy requirements, particularly in areas such as California, which find it hard to cope with energy demands in the summer months when air conditioning units are switched on.

The BP Institute uses its world-leading expertise in fluid dynamics to model the flow of air and heat through buildings. This work combines small scale experimental models with quantitative physical models of natural ventilation, hybrid ventilation, night cooling, solar driven ventilation and control systems for natural ventilation. Some research is funded by the Cambridge-MIT Institute, with emphasis on low energy design for theatres, large office blocks and schools.

An EU-funded collaborative project in the Martin Centre (Department of Architecture) is looking at the provision of low energy ventilation systems. Due to increasing levels of insulation and more stringent requirements for housing, ventilation heat loss is a growing percentage of domestic energy consumption. The low energy whole house system provides a passive solution to this problem: the passive stack ventilation systems expel air, as a result of the buoyancy in warm kitchens and bathrooms, and thereby power the movement of air. The supply air windows are effectively reclaiming a proportion of the heat being lost through the passive stack. This project will be tested under real house conditions in Poland, Denmark and Ireland.

The Centre is also providing consultancy on the design of a large complex of buildings 30km south-east of Athens which will house the European Law Centre. The Centre includes an assembly room lit by daylight through a series of sophisticated rooflights providing shade and ventilation (see photo). A procedure for calculating the energy saving from the use of daylight was carried out, using recently available sky luminance data from the European Daylight Atlas. The results showed an energy saving of 42% compared to conventional lighting.

The combination of new technology and better understanding of light and heat flows within buildings allows for a dramatic reduction in energy requirements and is of particular interest to the new growth economies in the world, notably China and India. Both of these countries are ideally placed to benefit from this research, which could help to alleviate some of the energy problems associated with rapid economic growth, rather than replicating the problems that developed nations are now having to face. For more information please contact Dr Aled Jones on awj10@cam.ac.uk.



The new extension to the School of Slavonic and East European Studies, UCL.

A novel method for high-precision joining of microelectronic components

Manufacturing micro-devices or electronic components, such as high frequency microwave filters and guides, requires high precision machining and joining processes. Components with extremely complicated profiles can be made using various Computer Numerical Control (CNC) machining techniques. However, most of these machined parts need to be joined to other parts in order to produce the final product. For instance, the welding/brazing process used for joining microwave components must provide a very good metallurgical bond between the parts without causing any change in the dimensions or cross section of the channels and irises of the final product. Figure 1 shows various machined components which require high-precision joining as a part of their production process. Currently most aluminium based microwave guides/filters are joined using conventional aluminium dip brazing processes. Dip brazing of aluminium has several major disadvantages. Firstly, these processes require application of a chemical flux to remove surface oxide prior to the brazing. The remaining flux should be removed from the irises and channels after the brazing process. Secondly, unlike most welding and brazing processes in which the formation of a fillet at the joint interface is desirable, the presence of a fillet will drastically reduce the efficiency of the microwave component.

A new method for flux-free brazing of aluminium in air, using gallium, has been developed, which is capable of providing high-precision bonds. The key feature of this new method is to control the thickness of the liquid phase at the joint interface in order to avoid any fillet formation. As no flux is required prior to the bonding process, post bonding cleaning or surface treatment is not necessary. The results of electronic measurements show that high frequency microwave guides can be manufactured using this new joining method.

Continued overleaf

Licensing Opportunities

These regular licensing updates will give you an insight into the opportunities available with Cambridge. If you would like to act on an opportunity - or explore a link for your company further - send an email, detailing what you require, and quoting the case number, to enquiries@enterprise.cam.ac.uk or telephone Boris Bouqueniaux, Case Administrator, Cambridge Enterprise, on +44 (0)1223 760339.

**Cambridge
Enterprise**

Biological opportunities

M3 - chemokine binding protein (Case number: Alc-486-99)

A pharmaceutical composition comprises M3 protein as encoded by virus MHV 68, or a homologue of said M3 protein, for use in binding to a chemokine or a chemokine analogue in vivo, or to block binding of chemokines to corresponding cell surface receptors in vivo, to produce an immunomodulatory effect, or to bind to a chemokine analogue present in a virus or parasite to block its entry into cells.

Biocatalysis in tailored ionic liquids (Case number: Bru-204-02)

Tailored ionic liquids designed for use as solvents for cofactor-dependent biotransformations. Enables the use of biocatalysis to conduct transformations involving organic molecules (such as morphine alkaloids) which are poorly soluble in water. Furthermore, the ionic liquids may be recycled and show very high chemical and thermal stability. This invention can conceivably greatly extend the application of biocatalysis in the fine chemicals and pharmaceutical industries.

Assay for the detection and identification of chromosomal aberrations (Case number: Fer-225-93)

This invention provides methods and reagents for detecting a chromosomal aberration in an animal chromosome or karyotype. In situ hybridization is used to label each chromosome specific probe with a distinctive spectrum of fluorochromes. After hybridization to the chromosome preparation from the diverged species the number of chromosome rearrangements can be determined. Clinical applications exist in analysis of human chromosome aberrations, cancer cytogenetics and animal cytogenetics.

Affinity absorbents for immunoglobulins (Case number: Low-301-02)

Novel rationally designed small molecule protein L ligands for the chromatographic purification of immunoglobulins. Inexpensive, chemically defined and non-toxic these synthetic ligands offer several advantages over natural protein affinity ligands, and can selectively distinguish between different IgG subclasses.

Papillomavirus Vaccines plus IL-12 (Case number: Sta-821-95)

The invention is that Interleukin-12 (IL-12) can be used as a therapeutic material in treating papillomavirus-associated lesions e.g. warts or condyloma acuminata.

Modified HPV-VLPs (Case number: Sta-822-98)

The invention consists of a method for synthesising and purifying artificial virus like proteins which retain the immunogenicity of the native pathogenic virus but with none of the infectivity.

Waste water treatment for activated sludge (Case number: Tun-338-01)

This invention harnesses micro-organisms to reduce activated sludge sewage volumes by up to a third in the waste water treatment process, leading to immediate benefits for the environment and a substantial cost reduction.

Software/Copyright opportunities

Lifetrack software (Case number: Hol-418-00)

Lifetrack is an electronic logbook designed for the large scale manufacturing and process industries. It provides plant operators and managers with a mechanism for the accurate recording, sharing and retrieval of plant status information. Lifetrack is in continuous operational use at a number of chemical plants around the world.

JBIG-KIT software library (Case number: Kuh-266-02)

JBIG-KIT provides a portable library of compression and decompression functions, with a documented interface, that can be very easily included into image or document processing software. In addition, JBIG-KIT provides ready-to-use compression and decompression programs with a simple command line interface. Further details are available at www.cl.cam.ac.uk/~mgk25/jbigkit/

JOY and FUGUE bioinformatics (Case number: Miz-779-02)

JOY is a program to annotate protein sequence alignments software with three-dimensional structural features. FUGUE is a program for recognizing distant homologues by sequence-structure comparison. It evaluates protein sequence similarity depending on the local environment of each amino acid residue in a known structure. Further details are available at www-cryst.bioc.cam.ac.uk/fugue/

Physical opportunities

Electrochemical annealing (Case number: Bur-142-00)

A method for annealing the surfaces of metals by electrochemical treatment. In particular, this method has been demonstrated on low-carbon, austenitic stainless steels such as 304L, where the removal of brittle martensite from the surface is accompanied by an increase in the surface hardness. Could be developed for other metals.

Nanotube-Polymer Composite Supercapacitors (Case number: Che-145-01)

These novel materials enable the construction of ultra-high capacitance supercapacitors, which combine the energy storage properties of batteries with the power discharge characteristics of capacitors. The combination of electrically conducting polymers with carbon nanotubes in composite electrodes provides a unique 3D network of electron/ion pathways. Applied to supercapacitor construction, such electrodes can provide a capacitance of over 2F/cm². Other applications include batteries, sensors, membranes, anti-electrostatic coatings, micro- or nano-electronics, etc.

Method of producing nano-onions and nanotubes (Case number: Chh-398-01)

A method of producing organic or inorganic nanoparticles and nanotubes which provides good separation of the particles from process by-products. The process is of importance for the low cost and large-scale production of nanoparticles, particularly of carbon nano-onions.

Structure for Strain Control (Case number: Cle-166-02)

Novel lattice structure of at least two materials which gives a controlled change in dimensions in response to changing thermal, electrical or magnetic conditions. This dimensional change can be much greater than that of either of the materials alone. It may also vary in a different way to either of the materials, potentially providing solutions to many engineering challenges. The University seeks licensing and collaborative relationships.

Coating of Nanoscale Arrays (Case number: Dav-158-02)

A method of forming arrays of molecules on pre-formed arrays of electrodes, with nanoscale precision. The method allows biological molecules such as oligonucleotides to be assembled into any desired pattern, and preserves their functionality when deposited. Successive depositions of different molecules allow complex arrays to be formed. Applications include genetic testing, sensors, functionalised surfaces and data storage devices.

Data Storage Device (Case number: Dav-201-02)

A digital data storage and retrieval device which enables information to be stored at very high density. Although it employs optical methods the device allows the use of 'bit sizes' far smaller than the optical diffraction limit of the read/write light.

Pipeline Protection (Case number: Hai-252-02)

A method of preventing pipeline scour for pipelines primarily laid on sandy seabeds. The method is low cost and can be fitted on new pipelines or retro-fitted during maintenance on scour-affected segments. The apparatus prevents the net flux of sand from around the pipeline, promoting a stable ripple around the pipe in preference to scour. It also prevents secondary scour which commonly occurs with existing scour prevention techniques.

Continued from page 3 It produces excellent shear strengths and microstructures similar to the parent aluminium alloy. This method is patented in the USA and a European patent application has been filed.

Dr Amir Shirzadi, of the Department of Materials Science and Metallurgy, has been working in this area for over a decade. He said "This technique offers a significant improvement over the

conventional methods of brazing and could potentially lead to significant cost savings in the future". Research is continuing with the aim of further developing the approach and extending it to other materials and applications.

For more information please contact Dr Shirzadi at the Department of Materials Science and Metallurgy on +44 (0)1223 334300.



Figure 1. Various machined components which require high-precision joining as a part of their production process.

Intel's 'Flyosaurus'

A New Species of Supplier Relationship in Manufacturing Innovation

Product and process technologies are evolving at an ever-faster pace, and today's manufacturers are being forced to develop almost continuous streams of innovation. At the same time, it is becoming increasingly difficult for any one company to single-handedly support an aggressive R&D agenda. Technology has become so sophisticated and expensive that even the largest firms can't do it all themselves anymore and even the most focused R&D programmes fail to consistently guarantee results. Realising that it is almost impossible to forecast where the next "big thing" will come from, many manufacturers have turned to their supply base as a source of innovation and new ideas.

To generate as many ideas as possible, companies prefer to establish relatively loose ties with a broad range of suppliers. These relationships tend not to entail major investment in jointly facilitated R&D activities and so leave each firm to develop and shape its own technologies in-house while staying in touch with what is happening in the marketplace. Clayton Christensen of Harvard Business School suggests that developing new technologies internally is a prudent strategy because it allows engineers to steadily push the performance envelope of the innovation without having to accommodate outside parties with standardised interfaces. This approach also keeps the company's operations flexible.

As Charles Fine from the Massachusetts Institute of Technology says, a company without substantial ties to other firms is free to speedily navigate through the marketplace and instantly change direction with the nimbleness of a fruit fly. However, the practice of keeping R&D activities in-house is not without its detractors. Proponents of outsourcing technology development argue that decision-makers in the manufacturing world are often driven by forces other than technology and the vagaries of the market. People do indeed engage in business transactions because of rational thinking, but they are also strongly influenced by emotional motivators such as trust and loyalty. There is a significant amount of evidence to suggest that businesses can benefit handsomely from developing long-term commitments with their suppliers. The lean manufacturing system, which champions close customer relationships based on trust, is often credited as a major factor behind the success of world-class Japanese companies such as Toyota, for example.

Engineers and employees can also develop familiarity and goodwill in these types of environments, which can in turn result in the fruitful sharing of ideas throughout the R&D process. After all, many technological breakthroughs over the years have happened not according to a well-defined research agenda, but through serendipity and spontaneous ideas. The discovery of penicillin in 1945 is a classic testimonial to the value of this entirely unpredictable phenomenon.

Close supplier relationships come at a price, however: firms that invest time and money in building trust and familiarity between one another almost certainly have to sacrifice some of their fruit fly-like nimbleness.

Weighed down by a large, relatively stable network of suppliers, these manufacturers lumber from one technology to the next like a weighty Tyrannosaurus rex. So on the one hand, pursuing R&D projects internally is expensive and leaves you unaware of what other firms are doing; while on the other, building lasting trust-based relationships with your suppliers might make your company sluggish and unresponsive to change.

Intel Corporation's Gene Meieran believes that the answer to this dilemma is to mix the best attributes of each R&D strategy—that is, to capture the benefits of supplier involvement without tethering your company to them forever; and he knows a lot about supplier relationships. Few large-scale sectors evolve and change as quickly as the microprocessor industry, and Intel has had to let go of some suppliers and forge relationships with new ones because suppliers sometimes find it impossible to react to radically new technologies or changes in the market, and companies like Intel clearly cannot remain competitive by maintaining their links with these firms until the bitter end.

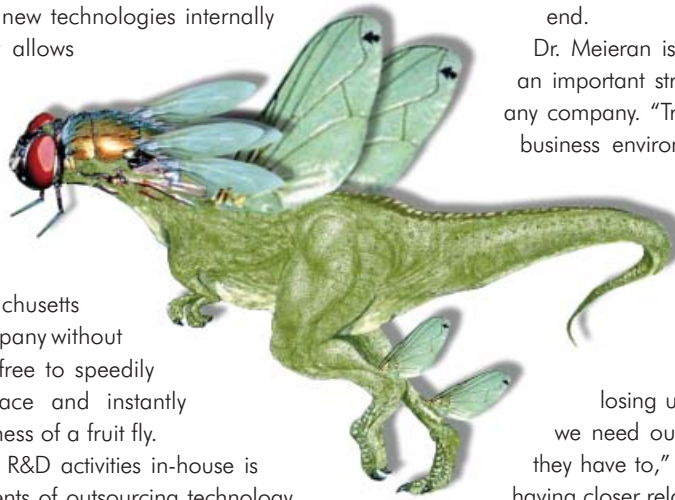
Dr. Meieran is quick to point out, too, that trust is an important strategic tool for Intel – or, indeed, for any company. "Trust is a big issue", he says. "Today's business environment is global and a proven track record is key." Intel prefers not to sever ties with a supplier in the name of a 5-10% cost saving. What the company gets in return is a cadre of loyal suppliers who will help Intel through crisis periods.

"When a factory goes down, we're losing upwards of USD1 million per hour. So we need our suppliers to be able to jump when they have to," says Dr. Meieran. He notes, too, that having closer relationships with its suppliers allows Intel to relax slightly its intellectual property protocols, thereby allowing the company's engineers to get to the heart of the matter when collaborating with suppliers.

Meieran's advice is to design an organisation that navigates through the marketplace with the nimbleness of a fruit fly, but which also has the weight of a Tyrannosaurus rex to move from one technology to the next with long-term supplier links intact. The result, he contends, is an entirely new species of supplier relationship in manufacturing innovation: the flyosaurus.

Despite its strengths, however, flyosaurus also has its weaknesses. Trust can take years to build, but can be destroyed in an instant. "Consider the Ford-Firestone situation," Dr. Meieran says. "The two companies had a century-long relationship in which Firestone manufactured tires for Ford vehicles. But that relationship came apart in a matter of weeks after the recall of Ford Explorers in 2002." Thus, like any species that cannot adapt to a new adversary or dangerous situation, it would seem that even the flyosaurus can be made extinct.

This article was first published in the IEE's Manufacturing Engineer April/May 2004. Robert K Perrons, University of Cambridge, Institute for Manufacturing, Mill Lane, Cambridge, CB2 1RX, United Kingdom. Email: perrons@alum.mit.edu



Digital Orient

Linking information technology to social science research – www.digitalorient.org

Just a decade ago few people could dream about the sweeping popularisation of a gadget, such as the mobile phone, as an aggregation of information technologies. Likewise, today, we still find it hard to draw a roadmap for technology development over ten to twenty years time. Information and communication technology is advancing more swiftly than any other human-invented technology in history and now seems to be having noticeable impact on the research methodology of social science (even though methodology applied in this scope often remains the same for many years). Digital Orient, a project directed by Professor Alan Macfarlane in the Department of Social Anthropology, is one practical instance that shows how IT can open up new opportunities in social science research.

The Digital Orient website (www.digitalorient.org) is still under construction but the outcome, according to its homepage, will be a platform for studies with four main functions:

- A program to record, present and understand the cultures of China, Japan, India, South Korea in an anthropological way. This is conducted by the integration of multimedia, huge data storage available on demand, and the dynamic interactivity of broadband capacities.
- An international online community connecting anthropologists and other individuals who share an interest in these cultures and are willing

to get closer to them from anywhere in the world. In other words, it serves as a locality for knowledge sharing.

· A window displaying the understanding of the role that broadband is playing in the construction of local culture and in the formulation of social identity in different countries. At the same time, it will explore the possibilities of a new approach to conducting ethnography with the help of broadband.

· A platform to carry a distance learning programme related to the social sciences, with particular focus on the academic and educational activities of the Department of Social Anthropology, University of Cambridge.

Some interesting material is already available on the website. By clicking on 'Collections' the viewer can access films about Oriental cultures, organised geographically and giving vivid impressions. For example, the film *The Day the World Took Off* properly occupies a conspicuous position here in answer to the question of why the Industrial Revolution took place in the West rather than in the once so culturally prosperous and technologically advanced East. Interested viewers can take a virtual trip with Professor Macfarlane, anthropologist Sarah Harrison and PhD student Xiaoxiao Yan, during their travels to China in 2003.

Continued overleaf

Taking the web worldwide



A small IT start-up based in Cambridge is celebrating a major run of success for achievements in the not-for-profit sector. Aidworld, which aims to extend Internet access to the 90% of the world currently unable to get online, has been awarded the Cambridge University Entrepreneurial Award for a not-for-profit initiative and a DTI R&D grant to invest in its software. This is a major vote of confidence for the company, which develops software to optimise websites for use over very poor connections, accelerating download speeds by up to 40 times and enabling access where previously impossible.

The software, available as an online filter, works by stripping out all extraneous information from a website to leave only the core text and links. Over the next year, new features will allow for images to be analysed and then either included or rejected. Layers of compression will be added so that, whether you are working with ultra-low-bandwidth somewhere in Africa or broadband in Cambridge, the filter will optimise the chosen website accordingly.

Connectivity problems arise because the Internet has been designed to work in wealthy countries with the assumption of a relatively fast user connection available at low cost. All the moving graphics, photos, colours, backgrounds, fonts and formatting seen in the average website dramatically increase the need for high bandwidth. Low bandwidth users have to wait much longer, and so pay more, for each page to appear. Given the intermittent nature of communications in most countries this increases the risk of connection failure during download, resulting in time and money being wasted and the information required never fully retrieved at all.

According to Alan Jackson, CTO for Aidworld, the Internet connections available to countries like Chad and Liberia, run at

half the speed of the average broadband connection available to a single household in the UK. In terms of cost, an Internet connection that would be priced at local call rates in the UK can cost well over £1000 a month in areas such as the South Pacific.

Aidworld is currently organising its first pilot project, working with the British Government's Department for International Development to improve Internet access for schools in Africa. It intends to add its service to existing projects and organisations to improve their efficiency and gain from their experience to continue building software that is really useful to the humanitarian sector and to the developing world.

Aidworld are hoping to use the Cambridge University Entrepreneurial award to build links with IT companies and other commercial advisors, whilst maintaining a strong relationship with the University and organisations such as the Red Cross and United Nations with which the company currently works. The Aidworld project intends to provide a way of linking together the contributions that academia, commerce and the humanitarian sector can make in order to improve people's lives across the world.

The Cambridge University Entrepreneurial Award, known as 3P - People, Planet and Productivity, was set-up with the intention of supporting initiatives with potential social and environmental benefits and to highlight the growing importance of Corporate social responsibility.

More information on Aidworld can be found at www.aidworld.org or contact Dominic Vergine on +44 (0)1223 700 776 or dominic@aidworld.org.

Continued from page 7 Under the 'Links' section the website lists relevant information resources that help to underpin the website as well as other interesting digital resources of anthropology, including hyperlinks to three other digital projects directed by Professor Macfarlane (alanmacfarlane.com, digitalhimalaya.com, letters2lily.org).

Alongside knowledge sharing, community building is an important goal of the website. Digital Orient has already set up an online Forum and a blog (web log, or online journal) is coming out soon. There are entrances to the Forum on every page and visitors are invited to make comments and state their thoughts: an attempt to stimulate academic interaction and intercommunication. Social anthropologists are often known as diary keepers, trying to record everything they experience daily. The blog offers an alternative way to keep a diary, with more flexibility and convenience for sharing and publication and more efficiency and accuracy in retrieval. It also carries the idea of a diary a step further by providing a space for sharing experience and feelings and so build a community. Digital Orient's blog will be powered by an open source program which will be adapted to serve the particular needs of a small group of people, most of whom are PhD candidates about to leave Cambridge on fieldwork trips.

The project has adopted this community-based concept from the beginning, through design to the deployment process. A groupware system is designed to facilitate collaboration within the content development group and allow for the pursuit of long-distance content contributors. Through the standard portal of the groupware system, which is constructed with MySQL databases and PHP, developers can submit their films and descriptions. Web pages are then automatically generated using templates, helping to keep a consistent form for content presentation. This system frees developers from the routine tasks of constructing web pages and allows them to focus on the more 'human' tasks such as film editing, which can't be conducted by machine.

Digital Orient itself serves as a good case for anthropological research. Xiaoxiao Yan, a PhD student under Professor Macfarlane's supervision,

is conducting research into the construction of broadband communities of practice which, she asserts, requires personal participation in that very process. Digital Orient provides a good opportunity for this as she manages and designed the website and the project will serve as a test bed for innovative ideas during her research.

Digital Orient has established collaboration with many organizations. British Telecom (BT), for example, has expressed interest in Digital Orient's valuable exploration of the relationship between broadband technology and culture. BT has provided financial support and access to information resources for the project and benefits from the collaboration by sharing insights generated by the project, which are essential for guiding broadband content development. Dspace, an open source digital repository system developed jointly by the Massachusetts Institute of Technology (MIT) Libraries and Hewlett-Packard Laboratories in collaboration with the University of Cambridge, provides considerable storage and large bandwidth for the videos on Digital Orient. The project also collaborates with an e-learning program in Shanghai Jiaotong University: the films in Digital Orient can enrich the content of the e-learning program and Digital Orient can gain access to a new audience of users. The study for broadband community building can also be conducted on a larger scale. For example, a program in Tsinghua University, studying a particular language which is only used by women in an ethnic group in China, participates in the content development group and shares interesting resources through the groupware system.

From its outset, the Digital Orient project has served not only as a platform for presenting research but also as a forum for building a knowledge sharing community. By taking advantage of the latest technologies such as broadband and MPEG4, the project aims to gain experience of broadband community building and, eventually, to provide insight into ways of facilitating the study of social science with the help of our thriving information and communication technologies. For more information please contact the project manager, Xiaoxiao Yan, at webmistress@digitalorient.org.

Calendar of Events

21-22 September International Manufacturing Symposium. Two-day symposium at Jesus College, contact ifm-enquiries@eng.cam.ac.uk.

22-24 September Cambridge Corporate Gateway. Industry – academic network opportunity with the Cambridge Network.

28 September Biotechnology Cluster Event – a celebration of Biotechnology in Cambridge hosted by University of Cambridge Enterprise and MIT Entrepreneurship Center, King's College Cambridge. Contact Julia.Hendry@rsd.cam.ac.uk.

29-30 September Technology Management Symposium 'Emerging Technologies: invention, innovation and implementation'. Contact ifm-enquiries@eng.cam.ac.uk.

19 October Horizon: Imaging the Future – an exploration of research in medical imaging research taking place at Cambridge. Day seminar and dinner.

8 December Horizon: Environmental Initiatives – Building the Future. Day seminar and dinner.

Unless otherwise stated, please contact Sue Rhodes on +44 (0)1223 765404, email sr295@cam.ac.uk for information on all our events.

See also www.clo.cam.ac.uk for more details.

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