



December 2009-January 2010

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## View from the Dean's Office

*Season's Greeting and a Happy New Year! Our final issue for 2009 contains a range of activities which embrace the Faculty Strategy. We include articles on Research, Enterprise, Outreach and International Collaborations, along with our usual complement of topical scientific essays aimed at a general audience.*

*I hope that you find these enjoyable and informative as well as getting the message that 'Sciences@Kent' are alive and well!*

*Best wishes for 2010!*

*Best wishes*

*Peter*



## Autumn brings £1.2M in Research Awards

During the last couple of months, the Faculty of Sciences has been awarded over £1.2M in research grants. These include four substantial research awards to academics across the Faculty. Professor Liz Mansfield (School of Mathematics, Statistics and Actuarial Science) £296,776 and Dr Colin Johnson (School of Computing) £307,678, both of whom received their awards from the Engineering and Physical Sciences Research Council. Professor Mark Smales (School of Biosciences) received £312,456 from Lonza Biologics plc and Dr Konstantinos Sirlantzis (School of Engineering and Digital Arts) received £227,841 from the European Commission. It's nice to end the year on a high certainly, but signs are that things are going to get tougher in the New Year. The Science and

Technology Facilities Council have announced budget cuts which critics fear will impact significantly on science and the next generation of researchers. This follows close on the heels of the global economic downturn which has led to an increase in costs, following a fall of the pound, in the UK's involvement in international science projects (e.g. the Large Hadron Collider at Cern). So does the future of Science hang in the balance? It seems hardly conceivable with the technological advances that are being made by UK scientists, but if the investment in research is substantially reduced in UK, it will be our loss.

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See page 4 for more details of the EPSRC Engineering and Physical Sciences Research Council award received by Dr Colin Johnson.



**Sciences means Business**  
page 6

## Major award for Professor of Computing Education

Professor Sally Fincher from the University of Kent has become the first British academic in 30 years to receive the SIGCSE Award for Outstanding Contribution to Computer Science Education.

Each year, the Association for Computing Machinery (ACM) Special Interest Group on Computer Science Education (SIGCSE) honours an individual or group in recognition of their long-lasting impact on, and significant contribution to, computing education. Their contribution may take the form of curriculum design, innovative teaching methods, textbook authorship or the development of new teaching tools. Recipients are selected from nominations by SIGCSE members.

Professor Fincher will be presented with her award at the 41st SIGCSE Technical Symposium in Milwaukee, USA, 10-13 March 2010. She will also give the keynote address at the Symposium.

Sally Fincher is Professor of Computing Education at the School of Computing, University of Kent, where she leads the Computing Education Research Group. She is co-editor of the Journal of Computer Science Education, a member of the Advisory Board of the Journal of Engineering

Education, and a member of the Editorial Review Board of the Journal of Computers in Mathematics and Science Teaching. In 2008, she was invited to become a Fellow of the Royal Society of Arts, and was recognised as Senior Fellow of the Higher Education Academy in 2007. She was made a National Teaching Fellow in 2005.

Professor Fincher said:

"One of our challenges is to bring the intellectual excitement of computing to the fore. SIGCSE has been a champion for this over many decades, supporting computing educators and contributing to an evidence-base of successful practice through their conferences and publications. SIGCSE takes their role seriously, and it is a great honour to be selected for this award."

Professor Simon Thompson, Head of the School of Computing, added:

"I am delighted to see Sally's award, which recognises the excellence of her approach to teaching innovation informed by evidence gleaned from her research in the area."

The SIGCSE award was initiated in 1981. Past recipients include: Randy Pausch, Carnegie Mellon University; Grace Murray Hopper, Rear Admiral USN, Digital Equipment Corporation; Alan Perlis, Yale



**Professor Sally Fincher,  
School of Computing**

University; Mordechai Ben-Ari, Weizmann Institute of Science; Eric Roberts, Stanford University; and Alan Kay, Apple Computer.

## Coaching for code-breakers

This term, the School of Mathematics, Statistics & Actuarial Science has run a new series of Mathematics Master Classes for gifted youth, with the support of the Royal Institution of Great Britain.

On six Saturday afternoons this term, starting with 31st October, some of Kent's brightest young mathematicians taking AS/A-Level have been visiting the University campus to take part in a series of classes on a wide variety of topics. The classes are led by experts in different areas of mathematics, both from the University and elsewhere. The aim of the sessions is to stretch the mathematical imaginations of young people who are fascinated by the subject, and want to learn where it may lead them beyond the school curriculum.

The first class of the series was taken by James Grime, from the Millenium Mathematics Project, Cambridge, who talked about the Enigma machine and codebreaking. The students learned how some of the country's brightest mathematical minds are employed to devise new codes and try to crack them. In the subsequent workshop, they were set a code-breaking competition. The students who cracked the most codes were awarded with prizes.

The evening before the first class, James also gave an open lecture to staff and students. He described the history of coding messages, and went on to tell the story of how British scientists at Bletchley Park managed to crack the Enigma codes that were used by the German military in the Second World War. During the presentation, he displayed the inner workings of an original Enigma machine, found in a field by an American soldier posted in France at the end of the war. The audience also learned how hard it is to hold a conversation without using the letter 'e'. The talk was very well attended, and the speaker stayed to answer questions for more



**Dr James Grime, Enigma Project Schools Officer,  
Millenium Mathematics Project, University of Cambridge**

than half an hour afterwards.

The topics of subsequent classes for sixth-formers range from the link between mathematics and music, to combinatorics, mathematical physics and chaos theory. Another series of classes, aimed at bright primary school pupils, is being run by Professor John Dore.

All classes are being held in the Maths Lecture Theatre in the Cornwallis Building, on Saturdays.

Further details: Dr Andy Hone (A.N.W.Hone@Kent.ac.uk).

**To try code-breaking yourself, go to:**

<http://enigma.maths.org/content/cd-rom-challenge>

## Kent develops prize-winning renal diagnosis software

A team from the East Kent Hospitals University NHS Foundation Trust (EKHUT) in collaboration with the University of Kent gained second place in the 'Innovation in Renal Medicine 2009' national competition run by the British Journal of Renal Medicine. Their System for Early Intervention in Kidney Disease (SEIK), has resulted in dramatic improvements in identifying early renal referrals. The team were awarded a prize of £2,000 by Professor Sir Roy Calne, a pioneer in the field of transplant medicine.

Kidney impairment may go undetected due to a lack of symptoms. However, if blood samples are analysed, kidney problems can be identified early. SEIK is an expert system which analyses anonymous data from GP patient records. Typical data includes blood test results, blood pressure and drug regimes. Some or all of this data may well have been originally collected for medical conditions not related to kidney problems. The system applies a set of medical rules to the data which enables it to identify patients who are at risk and then goes on to recommend possible kidney care and referrals. The data and recommendations for treatment are returned to GPs who can match the anonymous data and recommendations to the corresponding patient.

SEIK has made improvements by the timely detection of patients in need of attention and has significantly reduced the number of emergency referrals. Early diagnosis and treatment greatly improves the outcome for the patient. The system has also led to more effective use of hospital resources for scheduling referrals and treatment.

The SEIK system began as an MSc project, conceived by EKHUT and undertaken by Steve Grindle, a former University of Kent computer science student in 2004. Further work was performed by Jean Irving, another former student, before SEIK became a full pilot study involving EKHUT, the university and GP practices across Kent. Dr. Roger Cooley, a former lecturer in the School of Computing, supervised the early work, received a grant from EKHUT to continue working on the project, and has been closely involved with the project at all stages.

The pilot study began with the co-operation of a small number of GP practices and it has grown to include a large number of GP practices in East Kent, Medway, and Salford in Greater Manchester.

Dr. Roger Cooley said: " This project has involved a collaboration between the hospital and the University over several years. What started as a prototype software written by an MSc student has developed into a regional medical service and has begun to have a national influence. It is a gratifying demonstration of the advantages of collaboration. "

The successful team comprised staff from EKHUT and Kent: Dr. Chris Farmer (Team Leader); Dr. Paul Stevens; Director of the Renal Unit at the East Kent Hospital; Helen Hobbs, Research Nurse; Toby Wheeler, Systems Manager; Jean Irving, Senior Developer (former University of Kent computing student); Dr. Bernard Klebe Consultant; Dr. Roger Cooley (Hon. Research Fellow, University of Kent, School of Computing).



(L to R) Dr Roger Cooley; Toby Wheeler; Helen Hobbs; Dr Bernard Klebe; Jean Irving and Dr Chris Farmer.

## Royal Academy of Engineering Teaching Fellow for EDA



**Dr. Nai One Lai**

The School of Engineering and Digital Arts has been successful in its bid to participate in the pilot phase of the Royal Academy of Engineering Visiting Teaching Fellow Scheme which is part of the Academy's Engineering Design Education Initiative. The Visiting Teaching Fellows in the Engineering Design scheme complements the existing Academy Visiting Professor programmes by seeking to engage hands-on practitioners from industry to be involved in teaching design related activities and to act as role models for students within the School.

Dr. Nai One Lai was appointed by The School of Engineering and Digital Arts as a Visiting Teaching Fellow and joined the School in the 08/09 academic year. She has a first class

engineering degree from Leicester and completed a PhD under the supervision of Professor Spurgeon following a period working as a plant engineer for a newspaper publisher following her graduation. She has worked as a consultant for Accenture in London and recently moved to Goldman Sachs.

With support from the Visiting Teaching Fellow Scheme, the School of Engineering and Digital Arts has named its First Year Project Prize 'The Royal Academy of Engineering Teaching Fellow Award'.

This year's award ceremony took place on 8th October 2009 when Janos Kozma, Robert Horne and Duncan Kennaugh were awarded prizes for their First Year Robot Projects. The prize winners were each presented with a certificate and a cheque by Professor Yong Yan and Dr. Arthur Drinkwater. Ben Justin, Faris Al-Majali and Oyerinde Adeleke received the Highly Commended award.



(left) Janos Kozma, 1st Prize

(right) Robert Horne 2nd Prize



(left) Duncan Kennaugh 3rd Prize



(above) Faris Al-Majali Highly Commended



(left) Ben Justin, Highly Commended

## Grant awarded for Refactoring and Neutrality in Genetic Programming



The School of Computing at the University of Kent has been awarded a £300,000 research grant by the EPSRC (Engineering and Physical Sciences Research Council) to investigate novel methods of computer programming. The grant will fund a new project entitled Refactoring and Neutrality in Genetic Programming, and is based around using ideas taken from the theory of evolution in biology as a way of "evolving" computer programs to solve complex problems. Such approaches are becoming increasingly important as the complexity of problems solved by computers increases year-on-year.

Dr. Colin Johnson, lead researcher on the project, said:

"It is exciting to be working on a project like this that combines ideas from lots of different areas of science and technology."

Also involved in the project are Prof. Simon Thompson, the current head of the School of Computing at Kent, Dr. Alex Freitas, and Fernando Otero, who is just finishing his PhD at the University. This will build on existing work in the School, combining areas of expertise in programming languages and in nature-inspired computing.

The grant has been awarded by the Engineering and Physical Sciences Research Council, and is the latest in a number of awards to the School covering topics as diverse as automated diagram layout, mathematical proofs of the correctness of computer programs, and the design of next-generation computer operating systems.

(left) Dr Colin Johnson, Senior lecturer and Director of the Centre for Biomedical Informatics

## Prize-Giving and Reception for EDA MSc Students

A Prize Giving and Reception was held in the School of Engineering and Digital Arts on Thursday, 19th November for all MSc graduands, their parents and friends.

### Sagem Security UK Ltd prize

Dario Cattaruzza (below) was awarded the Sagem Security UK Ltd prize for the highest overall mark and joint highest project mark on the Information, Security and Biometrics MSc. The prize was presented by Dr. Fred Preston, Senior Director, Identity and Security Solutions, Sagem Security UK Ltd.



### Rohde & Schwarz Project Prize

Ahmed Abdalla Mamour Dahya (above) was awarded the Rohde & Schwarz Project Prize for the best project in the area of Wireless Communications on the Broadband and Mobile Communication Networks MSc. The prize was presented by Professor Sarah Spurgeon, Head of EDA, as Rohde & Schwarz representative, Mr. Phil McCluskey, was unable to attend due to the closure of the M2.

### Institute of Electrical and Electronics Engineers, United Kingdom and Republic of Ireland Telecommunications Prize

Srijittra Swaisaenyakorn (below) was awarded the IEEE UKRI Telecommunications Prize for the highest overall mark and the best project on the Broadband and Mobile Communication Networks MSc. The prize was presented by Dr. Nathan Gomes, Chair of the MSc programme.



The School currently runs five MSc programmes – in addition to the two mentioned above, there are taught courses in Embedded Systems and Instrumentation, Computer Animation, and Digital Visual Effects, and next year's Reception will also include prizes for the best students on these programmes.

## The Digital Media Hub Takes its First Step



**The Digital Media Hub core team of (L to R) Jim Ang, Ania Bobrowicz, Catherine Butler and Jane Milton**

Members of the new Digital Media Hub of the School of Engineering and Digital Arts attended the launch of the Innovation, Creativity and Enterprise (ICE) initiative at the new Innovation Centre near Beverley Farm on Tuesday, 17th November. Here, they met with business

leaders who they hope will become their future clients. The Digital Media Hub is designed to bring together the creativity of the School's multimedia technology and design undergraduates and graduates with local businesses. It is based in the student innovation zone which is being run by Kent Innovation and Enterprise. The space is designed to support students and offer expert usability and accessibility testing facilities to local companies. The Hub will also give access to other digital technological experts throughout the School and, ultimately, it aims to secure employment for students within industry. The Hub's lead academic is Jane Milton. Commenting on the event, she said, "It was a great night. The team was very pleased with the positive responses from business leaders and we made some good contacts". For more information on the Digital Media Hub, contact Catherine Butler on 01227 823251.

**Jim Ang was recently appointed as Lecturer in Multimedia and Digital Systems. In this issue, we introduce Jim who gives us an insight into his work. See page 8**

## High-profile engineering appointment at University of Kent to enhance student experience and employability

The School of Engineering and Digital Arts at the University of Kent has appointed Paul Tasker as a Royal Academy of Engineering Visiting Professor in Integrated Systems Design.

His appointment, which is shared with Cranfield University, is expected to enhance the undergraduate experience and better prepare graduates for an industrial career. It will also support both institutions' joint interest in the development of an integrated maintenance systems technology initiative.

Professor Sarah Spurgeon, Head of the School and a Fellow of the Royal Academy of Engineering, explained that engineering education has traditionally been discipline-specific (eg electronic engineering) with a strong emphasis on engineering, and the expectation that graduates work within their specialism throughout their career. 'However, the reality of the current workplace is that graduates frequently join multi-functional teams engaged in the development of complex system projects' she said. 'Therefore, system integration is something that should permeate the thought processes and procedures of all 21st century engineers and I am delighted to have this opportunity to work with Paul Tasker within

our undergraduate engineering curriculum.'

Professor Spurgeon added: 'Our School is among the most highly rated in the UK for graduate prospects, and exposure to the Royal Academy of Engineering Visiting Professor scheme can only enhance still further the employability of Kent's graduate engineers.'

Paul Tasker is a professional engineer and has undertaken a number of engineering leadership roles, primarily in the naval sector. He has held engineering responsibility for the design and support of defence equipment, most notably acting as Chief Engineer for the support service for the UK's Vanguard Class submarines before leading the design of the UK Astute Class submarines.

His most recent 'operational' role was as Engineering Director for BAE Systems' naval support business, after which he worked as the company's programme director for research into service and support engineering on the Support Service Solutions, Strategy and Transition (S4T) programme. This was aimed at developing a perspective on service applicable to 'Product Service Systems' for

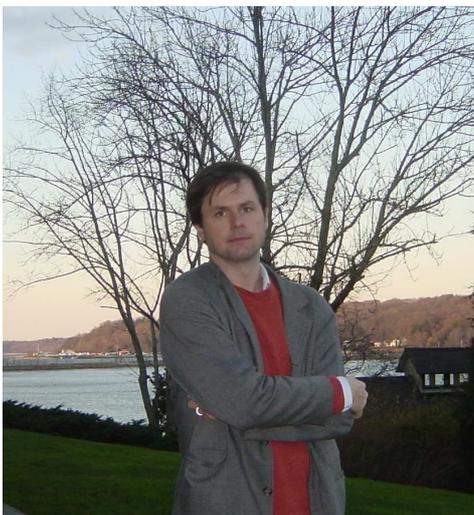
complex engineering products – such as fast jets, or nuclear powered submarines – with the intent to build new science to lead emerging practice in the sector.

Professor Tasker is a Principal Industrial Fellow at the University of Cambridge's Institute for Manufacturing.



**Professor Paul Tasker, Royal Academy of Engineering Visiting Professor, School of Engineering and Digital Arts**

## Researchers make significant advances in molecular computing



**Dr Dominique Chu, Academic Fellow in the School of Computing**

Following their research into molecular computing, academics in the School of Computing have been able to define fundamental limitations of 'biological computers'.

Molecular computing attempts to use components of organisms (e.g. genes) to run calculations inside living cells. Currently, most of the work in this area is theoretical or concerned with future applications of the technology, such as molecular computers being used to release drugs into the body or enhance our ability to study and learn from biological systems.

In a paper published by the Journal of the Royal Society Interface, the University's Dr Dominique Chu and his PhD student Radu Zabet have, by defining the fundamental limits of molecular computers, addressed the question as to how fast they can perform a computation – a prerequisite for the design of 'living machines'.

Dr Chu explained: "There are a variety of different mechanisms by which living organisms perform computations, and they do so at many different levels. Examples include the nervous system in higher organisms or even individual proteins. Understanding what constrains the efficiency and the speed of these computations is not only of practical relevance – for example, in the context of engineering purpose-built novel life forms i.e. synthetic biology – but will, most of all, provide new insights into the design principles of living systems."

"Our research demonstrates that the speed of bio-molecular computers is fundamentally limited by their metabolic rate or their ability to process energy. One of our main findings is that a molecular computer has to balance a trade-off between the speed with which a computation is performed and the accuracy of the result. However, a molecular computer can increase both the speed and reliability of a computation by increasing the energy it invests in the computation. With molecular computers this energy may be derived from food sources."

Dr Chu also explained the importance of these findings for computing in general. "This is one of the first papers deriving fundamental limits on the speed of bio-molecular computers" he said. "Our results are potentially of high theoretical and practical importance. Much work remains to be done, not just to fully understand its implications for the field of molecular computing, but also for our understanding of design principles of the living world."

'Computational limits to binary genes' (Nicolae Radu Zabet and Dominique F Chu) is published at <http://rsif.royalsocietypublishing.org/>



**Nicolae-Radu Zabet, Dr Chu's Research Student**

## Facial Recognition – see for yourself!



In last month's issue, we reported on the new facial identification software created at the University of Kent by Dr Chris Solomon, Reader in Physics in the School of Physical Sciences and Managing Director of VisionMetric Ltd at Canterbury Enterprise Hub. In this issue, readers can sample a taster of the effectiveness of the facial composite software E-FIT and EFIT-V in two images reproduced in this issue. The effectiveness already has a ringing endorsement of the West Yorkshire police at this year's E-FIT user conference at Wyboston lakes in Bedfordshire on Oct 29th and 30th, who reported a 40% naming rate using VisionMetric's new software EFIT-V over a prolonged period of use (20 months). This is exceptionally good - even a 20% naming rate is considered a good performance.

Early in the New Year, Chris will be accompanied by Dr Stuart Gibson, also from the School of Physical Sciences, on a visit to Pretoria, South Africa to give training to the South African Police Service (SAPS) which has recently ordered 10 software systems from VisionMetric and it is hoped and anticipated that there will be more to follow in the New Year...

The Next EFIT training courses in Canterbury take place in April 2010. Further details are available on [www.visionmetric.org](http://www.visionmetric.org)

**Would you remember this face if you saw it again? Turn to back page**

## Peanut Allergy: Causes and Prevention

Image: BBC News Health 20.02.09  
http://news.bbc.co.uk/1/hi/health/7899383.stm



Peanut allergy is one of the most serious food allergies since it not only causes severe reactions, but also because it is rarely outgrown and remains a life-long threat. Allergic reactions to peanut may include hives (itchy skin rash), sneezing, itchy watery eyes wheezing and cough, as well as vomiting and diarrhoea. In the worst case scenario, allergic reactions to peanut may be fatal as a result of difficulty in breathing and a dramatic fall in blood pressure, a condition known as anaphylactic shock. Although the worst forms of such reactions can be treated by the immediate application of adrenalin and antihistamines, there is currently no cure for peanut allergy.

Image: peanut-butter.org  
http://peanut-butter.org/peanut-butter-allergy-



To make matters worse, the number of deaths due to anaphylactic shock is likely to increase due to a sharp rise in the incidence of peanut allergy over the last decade, particularly in children. Why is

this the case? And what can be done to prevent and treat peanut allergy?

Once an individual has an identified peanut allergy, often, the only option available to avoid further reactions, is to remove all traces of peanut, both from the diet and the surroundings. However, this is rather problematical since peanut products are widely available both in food and some cosmetics.



Image: BBC Radio 4—http://www.bbc.co.uk/radio4/womanshour/02/2009\_30\_mon.shtml

This is further exacerbated by the fact that patients often respond to minute traces of peanut allergen. The likelihood of accidental exposure naturally leads to anxiety, social restrictions and overall poor quality of life in many peanut allergic patients. Paradoxically, peanut allergies are becoming more frequent in spite of greater public awareness which has resulted in reduced intake of peanut products in recent years. Interestingly, countries with high peanut intake, especially amongst young children, have a much lower prevalence of peanut allergy. This has led researchers at King's College London to hypothesise that increased dietary intake of peanut proteins at an early age somehow increases tolerance to peanut rather than immunological sensitization which may then lead to peanut allergy (Du Toit et al, 2008).

There is also speculation whether the rise of peanut allergy in the UK is a result of both a lack of tolerance (due eating less peanuts at an early age) coupled with environmental exposure to peanut through the skin. In general, our immune systems more readily tolerate foreign proteins that have been presented to us in the gut than through other routes, such as the skin. This makes sense,

since if our immune systems set up an allergic response to every foreign protein we ingest we couldn't eat! So, if we avoid eating peanut but still expose ourselves to peanut proteins in the environment through the skin, for example, the incidence of peanut allergy is likely to increase. Consider peanut butter: since it is so sticky traces of peanut protein are distributed widely throughout our homes and remains there for years allowing ongoing environmental exposure and increasing the risk of allergic reactions or sensitization of individuals to respond in an allergic manner.

Allergic sensitization to peanuts involves the production of certain types of antibodies, of the IgE class, that recognise peanut proteins (allergens) and bind to mast cells and basophils. These cells contain large amounts of histamine and other chemical mediators that govern the symptoms of allergies and also support the underlying processes that cause an individual to suffer from allergies (Falcone et al, 2006). Once sensitized with peanut allergen-specific IgE antibodies mast cells and basophils become activated upon exposure to peanut allergens and rapidly release their chemical mediators causing an allergic reaction. The author is currently collaborating with colleagues at King's College London to understand how people become tolerant to peanuts. Our goal is to be able to discover new treatments to try and "switch off" or even cure peanut and other food allergies.

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Dr. Bernhard F. Gibbs is Senior Lecturer in Immunopharmacology at the Medway School of Pharmacy. He studied Medicinal Chemistry as an undergraduate at University College London and then went on to lead a research group at the University of Lübeck in Germany, where he obtained his Habilitation in 2003. He joined the Medway School of Pharmacy in 2008 as a Senior Lecturer in Immunopharmacology. His research interests have focussed on human basophils, which play a crucial role in promoting allergic diseases. In addition to his teaching and research at the School he is a council member of European Histamine Research Society.



## Introduction of New Lecturer—Dr Jim (CS) Ang



Dr Jim (Chee Siang ) Ang joined the School of Engineering and Digital Arts in September 2009 as a Lecturer in Multimedia and Digital Systems. Before joining the University of Kent, he was a research fellow at the Centre for Human Computer Interaction Design, City University London, where he completed his PhD in the area of social gaming. He holds a Master' degree (Information Technology) from the Multimedia University of Malaysia and he obtained his BSc. (computing) from the Technology University of Malaysia. For the past seven years, he has been working on video game research, including the social aspect of video games and virtual worlds. Particularly, his area of research lies in analysing human behaviour and social networks within virtual worlds, as well as the application of such social technical systems in various domains such as training, education, behaviour intervention, etc. In this article, we introduce Jim who shares his enthusiasm for virtual worlds.

In the past few weeks, the game industry has been celebrating the success of the recently released game, "Call of Duty: Modern Warfare 2" whose five-day sales hit \$550 million. Across major media outlets, the game has been hailed as "one of the biggest releases in the whole of the entertainment history."



As an academic in the broad area of video game studies, I am always excited by news of this kind. Finally, video games are not treated just as a "play thing" only suited for adolescence. Certainly, the escalating economic importance of this medium in recent years cannot be easily ignored. Within academia, it has almost become the standard for academic papers to quote the game sale figures in their introduction.

However, can the commercial success be the sole yardstick that measures the social cultural importance of a medium? Even a quick look at Modern Warfare, and indeed the majority of commercially successful games, will immediately reveal the

problem of games as a new medium. The game industry tends to be stubbornly targeting the young (18-35) male population. Perhaps partly due to this, much of game content is violent in nature. Compared to its counterpart, the film, a much more diverse medium (and arguably the most successful medium of art in the 20th century), video games gravely fall short of what the medium can potentially offer.

Fortunately, signs of changes are already visible. We are witnessing the emergence of new game genres with an ambition to attract potential gamers that the industry has previously dismissed. For instance, The Sims franchise, a social life simulator, shows that managing your household in the suburbs is as (if not more) enjoyable as slaying trolls in the Tolkien virtual world; the Wii is determined to shatter the stereotypical couch potato view of



gamers; brain training games targeting older users are wildly popular.

In fact, video game studies have become a

major research topic in computer science, especially in Human Computer Interaction (HCI), an area I was formally trained in.

Games have evolved from an application designed for solitary play to complex social structures with thousands of users interacting with each other simultaneously. This gaming technology not only allows for synchronous communication, it also augments social presence, potentially bringing people closer to each other psychologically in a virtual setting. Apart from this, people are now able to perform collaborative activities online, such as collaborative writing, coordinating monster slaying, building houses together, etc. In this sense, computers not only mediate communication, but also the whole range of human activities. Therefore, it is sensible to call this "computer-mediated living". My research work, spanning across multi-disciplines, aims to study how these virtual environments can augment our life, e.g., on-line empathy in which people seek mutual support in a virtual space, how this technology can potentially improve the quality of life of certain groups such as older people, how we can change people's life by designing game-based behaviour intervention programmes.

The use of games for entertainment is only the tip of iceberg of what's possible. I truly believe this interactive medium, empowered by the development of new digital technology will have a deep impact on how we live our life in the near future.



## ESDC Celebrates 15 Years of Working with Industry



**(L to R) Peter Parsons (Head, Kent Technology Transfer Centre), Ann Bentley (University of Kent Research Services), Peter Lee and Winston Waller outside the DTI Offices in 1994 after presenting the University of Kent Bid (Photo by Keith Dimond)**

The Electronics Systems Design Centre (ESDC), based in the School of Engineering and Digital Arts, will this month celebrate 15 years of activity in helping regional companies with electronic design in projects and developments. The Centre was established with funding from the DTI in Nov 1994 as part of the national Microelectronics in Business (MiB) Programme which funded a national awareness campaign and nine regional Support Centres based in Universities. Following a comprehensive tendering process and short-listing, the University of Kent was chosen as the South-East Regional Support Centre for the programme which aimed to encourage mainly SMEs (Small and Medium Size Enterprises) to adopt "new to them" electronic technologies into their product design. Although the programme was initially planned to run for three years, its success led to an extension of the contract which was further enhanced by funding through the EU Framework IV FUSE (First USE) funding programme for companies using new electronic technologies for product development for "the first time". The ESDC acted as a Technology Transfer Node for this programme and also bid successfully with

eight/nine local SMEs for FUSE funding. The continuing success of these activities resulted in further funding from the DTI to extend the programme and, in 1998, the ESDC successfully bid for further funding for a new DTI-funded programme in Electronics Design. During this period the ESDC was able to develop and build links with a large number of local companies working in or with electronics. This has also led to the successful application for eight TCS/KTP projects. To date the ESDC has a 100% record for KTP applications. In 2001 the ESDC received £200,000 of funding from SEEDA to help it develop a small scale SMT facility which is still running today. Overall the ESDC has generated over £1.8 million of income since 1994 and established many strong links with local companies.

Direct government or regional funding for the ESDC ended in 2003 but it has continued its work in self-funding mode by continuing to promote schemes such as KTPs in the region. Recent successes include KTP projects with C. Scope, Timeplan and EMS. In 2007 the Centre became a regional representative for the newly formed electronics KTN (Knowledge Transfer Network) which is managed by the Technology Strategy Board (TSB). The KTN network is seen as a successor to the MiB and ED type programmes. Peter Lee, currently Director of the ESDC, has been invited to become an academic representative on the eKTN management board.

Within the School there has been recognition of the importance of enterprise-based activities with the appointment of a School-based Director of Enterprise (Winston Waller) and an Industrial Liaison Officer (Catherine Butler), both of whom have worked as part of the ESDC Team. Using ESDC as an example of best practice, enterprise activity in EDA has now spread out to encompass the whole School, and collaborative enterprise activities with other Schools. The ESDC remains an important focal point for the School's interaction with both local and National Industry: a number of companies first contacted through the ESDC now sponsor placement students, UG and PG projects, a range of project prizes and are active members of the School's Industrial Panel. These activities impressed the IET during its recent accreditation visit in 2008.

In future the ESDC will concentrate on developing its activities towards licensing and consultancy related to its research in Embedded Systems and Instrumentation.

## Telecommunications Expert in Demand

**Dr Nathan Gomes from the School of Engineering and Digital Arts has been clocking up some air miles. He presented an invited paper at the IEEE Photonics Society Annual Meeting Belek-Antalya, Turkey, in October. The paper, entitled "Generation of tunable high frequency signals using optical phase modulation", was co-authored by Dr Pengbo Shen, also in the Broadband and Wireless Communications Group.**

The following week, Dr Gomes attended the IEEE International Topical Meeting on Microwave Photonics in Valencia, Spain, where he chaired a session on Radio over Fibre Systems, was involved with prize and post-deadline paper judging as a member of the Technical Programme Committee, and also presented papers. And then, the week after that, he was in Lisbon for project meetings of the EU-funded large-scale Integrating Project "FUTON".



**Dr Nathan Gomes**

## ***E. coli*: A diverse group of harmless and pathogenic bacteria**

Dr Ian Blomfield is a Senior Lecturer in Molecular Microbiology in the School of Biosciences. His research interests focus on the regulation of virulence factors in bacteria such as *Escherichia coli*. Dr Blomfield talks about a range of diseases caused by *E. coli*, including infections by enterohaemorrhagic *E. coli* and urinary tract infections.

Although many "commensal" strains of *Escherichia coli* (*E. coli*) live harmlessly in the human intestine, other strains are pathogenic. Moreover, while some pathogenic *E. coli* cause intestinal infections, and may even contribute to Crohn's disease, others cause extra-intestinal infections including meningitis, pneumonia and, most commonly, urinary tract infections (UTI). However, turn on your television or open your newspaper and you will most often hear about serious disease and even death caused by the infamous *E. coli* "O157:H7" bacterium. This strain, which belongs to a subgroup of *E. coli* termed enterohaemorrhagic *E. coli* (or EHEC for short), frequently grows in the intestines of a variety of farm animals. In these "hosts" the bacterium causes mild, if any, illness. However, it can - and does - contaminate our food and water supplies during the growth of, or during the preparation of, food. Infection can also occur following contact with infected animals (such as in petting farms).

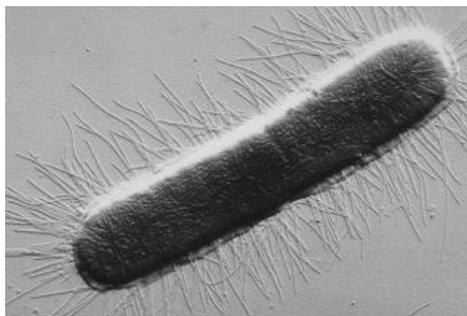


**Image:** Children feed goat at petting zoo, Blair Drummond Safari Park, Stirling, Scotland, May 2008. : Rex Features Guardian.co.uk, 20 Sep 2009

Fortunately, although the bacterium is relatively robust, and hence able to survive in the environment for extended periods of time, it is readily killed by proper cooking or standard disinfectants. Thus many infections can be prevented by avoiding foods such as under-cooked meat and unpasteurised fruit juice, and ensuring that good hygiene practices are followed properly particularly during contact with farm animals. While sometimes tragic for those involved, it should also be understood that relatively few people are affected, and although it would of course be desirable to eliminate EHEC from our food chain, its widespread presence would make this difficult to do. Nevertheless, diminishing animal-to-human

spread of the infection, by, for example, vaccinating animals against O157:H7, is one way in which infections might be prevented in the future.

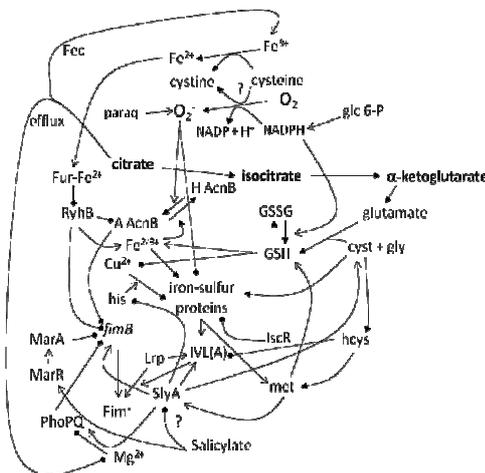
Although less well publicized, but afflicting far greater numbers of people worldwide, are gastrointestinal infections caused by other strains of *E. coli*, including EPEC (enteropathogenic *E. coli*) and ETEC (enterotoxigenic *E. coli*). Infection, which causes diarrhoea, usually occurs when poor sanitation results in water supplies becoming contaminated with human waste. For those in good health, but who lack the immunity acquired from prior encounters with these bacteria (e.g. tourists), such infections generally lead to an acute and unpleasant, but not life-threatening, bout of "travellers diarrhoea" that can spoil a foreign holiday. However, for young and already malnourished infants such infections are often lethal. In addition to intestinal infections, younger children, hospitalised patients with indwelling catheters and women of childbearing age frequently suffer with urinary tract infections caused by UPEC (uropathogenic *E. coli*). Indeed, bladder infections (cystitis) caused by UPEC, while not usually life-threatening, are a leading reason for GP visits and a substantial cause of lost productivity. Moreover they can cause kidney infections (pyelonephritis) with an associated danger of renal damage or life-threatening bloodstream infections (sepsis).



**Figure 1. The bacterium *Escherichia coli* showing the presence of the type 1 fimbrial adhesin**

Research in my laboratory, which is funded currently by the Wellcome Trust, aims to explain how the production of a critical "virulence factor" - the type 1 fimbrial adhesin (the hair-like projections on the bacterial cell surface in Figure 1) - is controlled by UPEC and other strains of the bacterium. Work by Scott Hultgren's group at Washington University has shown that the adhesin allows the bacterium to attach to, and then invade, bladder cells, to form intracellular communities.

Studies in my laboratory highlights a complex control pathway involved in regulating the adhesin's production (outlined in Figure 2).



**Figure 2. Metabolic intermediates and regulators that control type 1 fimbriation currently under investigation in the Blomfield laboratory.**

Moreover, our recent results show that the bacterium decreases production of the adhesin when a range of noxious chemicals, such as salicylate - the active ingredient in aspirin - are present. The emergence of antibiotic resistance in UPEC is a concern, as it is in other bacteria, and our results suggest that compounds other than conventional antibiotics might be used to treat UPEC infections. There is considerable interest in developing alternative therapeutic agents that inhibit the adhesin's production, and this topic will remain a key focus of investigation in our laboratory in the future.

Dr Ian Blomfield completed both this BSc degree in Biology and PhD in bacterial genetics at the University of York, before joining Professor Barry Eisenstein's laboratory in the Department of Microbiology and Immunology in Ann Arbor, Michigan. Here he developed techniques for genome engineering in bacteria and studied phase variation as a mode of gene control in *E. coli*. In 1992, with funding from the NIH and Eli Lilly, he moved to a faculty position at Wake Forest University School of Medicine in North Carolina. He moved to Kent in 1999, where he has continued to work on the regulation of adherence in *E. coli* with funding from BBSRC and the Wellcome Trust. He is currently a core member of the BBSRC's Research Committee B: Plants, Microbes, Food and Sustainability.



## British Council Funds Scientific visits to SE Asia

As part of the Faculty plan to increase opportunities for students to spend time in other environments, Professor Peter Jeffries submitted a bid under the PMI2 scheme of the British Council to fund visits by students to four of South East Asian partner institutes, three of which are in Thailand: Pibulsonkram Rajabhat University (PSRU); Naresuan University and the National Center for Genetic Engineering and Biotechnology (BIOTEC). The fourth is the Universiti Teknologi in Malaysia (UTM).

The bid was successful and throughout the past year, we have been able to support both short-term trips by postgraduates and longer term visits by undergraduates to conduct research projects abroad as part of their placement year.

To bring a flavour of South East Asia to our readers, two of our postgraduate researchers who visited Thailand earlier this year, have written about their experiences.

Louisa Robinson-Boyer is a PhD student registered at the University of Kent. During the summer, Louisa spent 3 weeks in Thailand where she attended a conference on fungal evolution and got her hands dirty in the forest as part of her research with the Faculty of Science and technology at Narasuan University, Phitsanulok in Northern Thailand.

attended a conference on "Fungal Evolution and Charles Darwin: From Morphology to Molecules" at BIOTEC, Bangkok which is was relevant to my PhD. At the conference I met up with my colleague Dr Cherdchai Phosri from PSRU with whom I have collaborated in our research into AM fungi.

In my last week in Thailand I was able to visit PSRU in Phisanulok, a large modern city and to work with Cherdchai in his labs.

I very much enjoy Thai food and I enjoyed eating out with the locals often, even though a few 'salads' were rather hot! We had the pleasure of stopping at some amazing coffee shops on the journey through the mountains to the forest.



"The main reason for my visit was to visit the National Center for Genetic Engineering and Biotechnology (BIOTEC) and to talk to their researchers and see their laboratories. I was able to gain experience of real-time PCR and high throughput sequencing, both of which I hope will be part of my PhD studies. I was very impressed with their very well-equipped and very modern looking labs, and pleased to find signs showing that they have the same lab management issues as us all. I also had the opportunity to visit and collect fungal samples from protected forest in the North of Thailand.

When I first arrived in Thailand, I



As part of our research, it was necessary to spend some time in Phu Kheo national park. With enough food and water for 3 days, we spent our days in the sun, rain and extreme humidity in temperatures of 38°C sharing our base-camp with the usual jungle residents of Roe deer, many insects, spiders, and leeches (1 of which got me!).



The national park has many wild animals including elephants, rhino, bears, boars and tigers, though thankfully only the deer came into camp.



My new friends felt that I should try the local Ganoderma (fungus) drink, which is said to be able to revive one from the dead!!

I was fortunate enough to spend some leisure time in Bangkok where I went visited some of the temples and relaxed into a Thai massage or two.

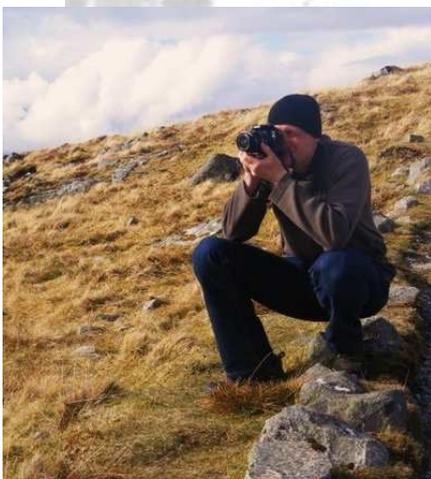
My time in Thailand was well spent and my research continues to benefit from the collaboration with my Thai counterpart."

**Louisa Robinson-Boyer** is studying for a PhD in Community structure of 'Arbuscular Mycorrhiza in response to agroecosystems'. She spends most of her time at East Malling Research under the supervision of Dr Xiangming Xu. Louisa completed her undergraduate degree in Biology in 1999 at the University of Sussex and later her MSc entitled 'Genetic diversity of Arbuscular mycorrhizal fungi from China' at the University of Kent. In between her PhD studies, Louisa consults for Plantworks, a SME based at Kent Science Park retailing mycorrhiza inoculum.



## British Council Funds Scientific visits to SE Asia

Dr Matthew Maylin, a Research Associate in the School of Physical Sciences visited the Faculty of Medical Science at Naresuan University, Phitsanulok in Northern Thailand in August.



"The purpose my visit was to make ties and look at the possibilities and scope for future collaborations. Ideas were developed during this time, but some are quite ambitious, and will need further funding and ethical approval. On arrival at the Naresuan University, I was warmly welcomed by Dr Sukkid Yasothornsrikul the Associate Dean of the Faculty of Medical Sciences and his colleagues, and was soon made to feel at home within the Faculty. My mandatory duties were light and I was happy to attend the daily English lessons to assist with pronunciation each morning - so forever leaving the impression of a Kent/London accent on the students.

I enjoyed all of my time in Thailand. I was fortunate to experience incredibly engaging research on autopsy dissections, including the large pile of brains I was able to witness - although this was probably my morbid scientific curiosity coming out.

One aspect of Thai culture to which I was introduced was the custom of students wat-ing Faculty members as a sign of respect - this consists of bringing your hands together towards the face and bowing your head slightly - this would be unheard of amongst the undergraduates in Britain - although a custom I think we should adopt. In between work, I indulged in some leisure activities including white water rafting a level-4 river, in other words,

kayaking through rapids where it's necessary to have the competence of being able to perform a reliable white-water roll amongst other skills.

In my last week in Thailand I was able to visit Bangkok, a large modern city. I was able to present our current research and the EFIT-V facial composite system to the Thailand Central Institute of Forensic Science and the Royal Thai Police Force. Both agencies were especially friendly and offered us additional images for our data set. It is our hope to be able to produce a Thai version shortly.

At the time of writing this article we are also expecting to have two Thai students visit our group on the exchange and plan to extend them as much hospitality as

Matthew is a keen photographer and took the opportunity of indulging in his passion during his trip. These are some of the images that he took.



**Dr Matthew Maylin** has been at the University of Kent for over a decade. He completed his undergraduate degree in Computational Physics in 2001, his M.Sc.-R entitled 'Colour recognition using artificial neural networks' in 2002, and his PhD entitled 'Application of statistical appearance models for the analysis and restoration of the human face' in 2006. During the four years of his Ph.D he also developed the EFIT-V facial composite system now used in over 20 police forces world-wide. He now remains the sole software engineer for VisionMetric, a university spin-out company specializing in forensic software. He has also been involved in several post doctoral projects, including those in collaboration with the FBI and DSTL (Defence Science and Technology Laboratory).

## Knockholt Stingers are smart move champions of LEGO® Competition



**Knockholt Stingers, from St. Katherine's C of E Primary School**

Knockholt Stingers, the team from St. Katherine's C of E Primary School, beat sixteen teams from schools across Kent and Medway to become the overall winners of this year's FIRST LEGO® League (FLL) Regional Final. They fought off stiff competition and performed well across all seven categories to win their trophy, a winner's cup made entirely from LEGO®.

The FLL is an annual event which engages school children in science through themed activities including a robot challenge and practical project work. It requires teams to work on challenges over the autumn term and culminates in a Regional Final event which was hosted, for the seventh consecutive year, by the University of Kent at their Canterbury campus on Tuesday 24th November. 140 pupils aged between 9 and 16 took part and, together with their supporters, created a fantastic atmosphere.

The winning team will go forward to the UK final at Loughborough on 23 January 2010.

This year's competition theme, smart moves, focussed on transportation. Teams were asked to consider transport in their local area and to identify ways in which it was underperforming by considering issues such as safety, efficiency and energy consumption. They were then asked to devise solutions to solve these problems, and to present their findings in a creative way to a panel of judges at the Regional Final.

The 'smart moves' robot challenge required the teams to program a sensor-equipped vehicle (a robot built using a LEGO® Mindstorm

programmable controller) to perform a set of tasks in a test environment.

These tasks corresponded to transportation activities such as gaining access to places, avoiding impacts and traffic jams, and keeping passengers safe.

All participating teams said how much they had enjoyed this year's challenge and all were awarded medals and certificates at the end of the day. The cups were awarded to the winners of the seven categories by the Mayor of Canterbury - Dr Harry Cragg, Professor Simon Thompson, and other personnel from the University of Kent including one disguised as Mr. LEGO®.

Overall winners (and off to the national finals in January at Loughborough University):

Knockholt Stingers (St. Katherine's C of E Primary School)

Presentation award:

OO Lego (Whitfield and Aspen School)

Robot design award:

Langton Lego Lads (Simon Langton Grammar School for Boys)

Robot performance award:

Mindstorms Masters (Cornwallis Academy)

Teamwork award:

Boffins and Bodgers (Byron Primary School)

Team spirit award:

Kings of Lego (Sandwich Technology School)

Judges special award:

Kemsing (Kemsing Primary School).

This year's Kent and Medway regional final was organised by the University of Kent's Partnership Development Office and the School of Computing in conjunction with Medway Business Partnership. It was supported by the British Computer Society. Seventeen schools participated in the

competition. They were:

- \* Tunbridge Wells Grammar School for Boys
- \* Brunswick House Primary School
- \* Whitfield and Aspen School
- \* SAP
- \* Simon Langton Grammar School for Boys
- \* Reigate St Marys School
- \* Archers Court Maths and Computing College
- \* Byron Primary School
- \* King Ethelbert School
- \* Kent College
- \* Cornwallis Academy
- \* Hillview School for Girls
- \* Queen Elizabeth's Grammar School
- \* St Katherine's C of E Primary School
- \* Valley Primary School
- \* Kemsing Primary School
- \* The Ellington and Hereson School

Planning for next year's FLL 2010 competition is already underway when the theme will be 'Engineering Meets Medicine'. Teams will explore the cutting-edge world of Biomedical Engineering to discover innovative ways to repair injuries, overcome genetic predispositions, and maximize the body's potential, with the intended purpose of leading happier and healthier lives.



## Sciences personnel produce local history DVDs

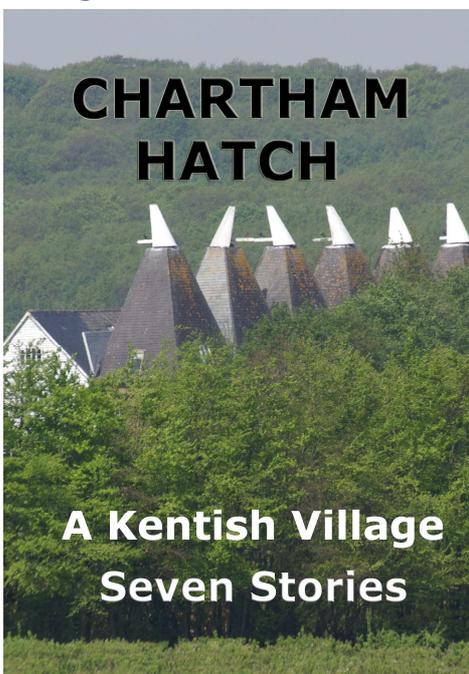
For the past two years, John Batchelor, Nigel Simpson and Jenny Harries from the School of Engineering and Digital Arts have spent most of their evenings and weekends producing two local history DVDs.

### The Canterbury and Whitstable Railway

"The Story of the Canterbury and Whitstable Railway", the first in a series being produced by Harbour Heights in association with Multimedia in the School of Engineering and Digital Arts, was launched on 7th May 2009 at a champagne reception in Woolf College. The DVD, which celebrates the fascinating saga of a pioneering railway, was designed and created by Liz Valentine, a former Multimedia graduate who also provided the informative and enlightening narrative. Liz joined the School as a Research Assistant in July. John Batchelor, who had previously directed "Canterbury '42", a multimedia DVD resource for schools about the Blitz in Canterbury, was asked to help and he and

As well as John's talk, the evening featured an exhibition of archive footage taken in Canterbury and Whitstable as well as photographs of the Railway in operation. It was pleasing that the reception of the talk and DVD was so positive which demonstrates that modern digital ways of documenting history can be highly effective. The talk has since been delivered to several local groups by John Batchelor (a 2nd DVD called "Crab and Winkle Then and Now" is available).

### Chartham Hatch—A Kentish Village—Seven Stories



"Chartham Hatch – A Kentish Village – Seven Stories", produced by Jenny and three other villagers, was released in the Chartham Hatch Village Hall in April 2009. Following the success of their lottery-funded book "Chartham Hatch – Village School to Village Hall" published in July 2007, this two-and-a-half-hour DVD, also lottery-funded, follows five former residents through the village and, using old cine film and photographs, interview recordings, current photographs and video footage, shows how the village has changed. There are also chapters on past and present activities in the village, the restoration of the tower on the top of the village hall and the launch of the book in 2007. Jenny and the team researched, wrote, directed and edited the material themselves, with Liz Valentine again providing the technical expertise. The DVD has been extremely well-received, again highlighting how modern documentary film making can make local history accessible.

## Kent Alumni Takes PM's Top Prize Down Under



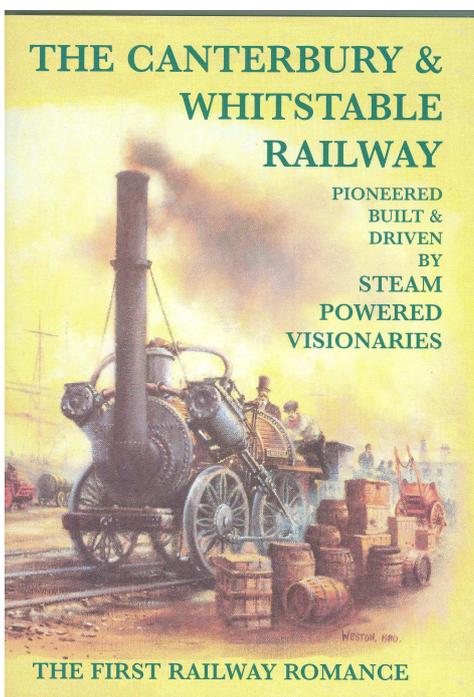
Associate Professor Mahfuz Aziz

When Mahfuz Aziz graduated from Kent in 1993 with his PhD, having been supervised by Winston Waller, from the then Electronic Engineering Laboratory, who could have known that sixteen years later, he would be awarded one of the most prestigious prizes in Australian higher education. Last month, Associate Professor Mahfuz Aziz was awarded the Prime Minister's Award for Australian University Teacher of the Year, worth \$50,000 along with international recognition as an engineering teacher dedicated to the success of his students.

Selected from 24 university teachers from across Australia who received Awards for Teaching Excellence this year, Australian Learning and Teaching Council's Executive Director, Professor Richard Johnstone, described Mahfuz Aziz "... as an outstanding teacher with an impressive commitment to his students' learning who has made a significant contribution to international learning and teaching research."

He has conducted collaborative research with leading European institutions into education circuit design tools and incorporates this into his teaching resources, which are used in institutions around the world. His teaching methods focus on the development of student independent learning, problem-solving and critical thinking abilities.

But what do the students say? Well, third-year Bachelor of Engineering: Computer Systems student, Simon Kupke, says of Dr Aziz, amongst other tributes that "[Dr Aziz] is one of the best lecturers I have had because you know he cares and that he goes above and beyond what you would expect from a university lecturer."



Nigel Simpson, who is an Archaeology graduate from Kent, worked with Liz and the DVD's producers to tell of the founding and operation of the historic line. John Batchelor also gave a presentation at the launch on the legacy and history of the line since its closure featuring a clip from the 1950s Ealing comedy 'The Titfield Thunderbolt' and a Google Earth flyover of the railway route as it is today.

## Royal Academy Distinguished Visiting Fellowship – Professor Eliot Moss



**Professor Eliot Moss, University of Massachusetts, who came to the School of Computing**

Professor Eliot Moss, from the University of Massachusetts, is a world expert on garbage collection and one of the inventors of software transactional memory, an important technique for concurrent programming. He visited the School of Computing to work with Richard Jones. The aims of the visit were to identify further areas for collaborative research, to complete a new book and to advise in the development of a new Masters course covering advanced programming for multi-core systems.

Eliot has been a member of the Computer Science faculty at the University of Massachusetts since 1985, and was named an ACM Fellow by the Association of Computing Machinery in 2007. He has served on the executive committee of SIGPLAN, the ACM Special Interest Group for programming languages. His first collaboration with Richard Jones in 2001 led

to the ground-breaking Beltway paper, generalising all known copying garbage collection algorithms; Beltway has recently been adopted by Sun Microsystems new Java system, Maxine. Eliot first visited Kent in 2004 when he was invited to speak at the EPSRC MM-NET Summer School organised by Richard. This latest visit was courtesy of the Royal Academy of Engineering Distinguished Visiting Fellowship scheme.

Staff and students from the Faculty of Sciences at Kent learnt about Eliot's latest research through a series of seminars given by Prof Moss. He also had discussions with the School of Computing's Concurrency Group, part of the Programming Languages and Systems Research Group, which is internationally renowned for its approach to concurrency and process-oriented programming.

Richard, Eliot and their colleague Tony Hosking, of Purdue University (who visited Kent for six months last year), have been working on a new book on garbage collection. Garbage collection automatically recycles the memory used by modern programming languages and is a vital technology supporting applications from e-commerce to games on mobile phones. The new book will bring the field up to date, and focuses especially on the challenge of implementing high performance garbage collectors on modern parallel hardware. The book, to be published by Taylor and Francis in 2010, is expected to supplant Jones's 1996 book as the definitive reference for students, researchers and developers working in this area (which has been cited by nearly 1000 other publications).

Multi-core systems, including the latest multi-core CPUs and programmable graphics processors (GPGPUs), have taken over from the single-core processor and are now commonplace. However, very few existing software applications make good use of these technologies particularly because there is a shortfall of programmers who can fully

exploit these systems. The University of Kent has responded to this shortage by developing a new Masters course, the MSc in Advanced Programming for Multi-core Systems. Prof. Moss was able to provide expert advice on the design of this new MSc programme which will focus on concurrent/parallel design and programming techniques as well as the latest parallel hardware architectures and software platforms. It is believed that this new course will be the first in the world to focus on this vital technology.

Richard Jones has a reputation as one of the leaders in the field of garbage collection. His work was recognised when he was named as a Distinguished Scientist (the first in Europe) by the ACM in 2006, and by the University of Glasgow who awarded him an Honorary Fellowship in 2005 for "his international distinction through his research and scholarship in dynamic memory management and garbage collection, ... and the esteem in which he is held throughout the computing world". Richard co-founded the International Symposium in Memory Management, the leading conference series in this field, in 1996. He sits on the Editorial Board of the journal Software Practice and Experience (Wiley) and regularly serves on the committees of major conferences. His work has been supported by IBM, Microsoft and Sun Microsystems as well as the Engineering and Physical Sciences Research Council.

Richard Jones said:

" We are very grateful to the Royal Academy for supporting this visit. The opportunity to work face to face with Eliot has been invaluable. I am sure that Prof Moss's advice will help make our new Masters programme become a 'must take' course as concurrency skill becomes a more and more essential component in a programmer's toolkit. "

Professor Moss visited the School of Computing from 2-20 November 2009.

## Junior chess club - Spring meetings

The Canterbury Junior Chess club, for 10-16 year olds, will meet on Saturdays from 2-4pm in the Peter Brown Room in Darwin College on the following dates:

16 January	20 February
30 January	6 March
13 February	20 March

For further information, contact Dr Owen Lyne 01227 (82)3657, o.d.lyne@kent.ac.uk



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## Recent Grants Awarded

### School of Engineering and Digital Arts

Dr Nathan Gomes has been awarded £234,000 for Telecommunications Training Services by Post Telekom Kosovo.

Clive Birch has been awarded £4,566 for a Mechanical Workshop by Ancon Technologies Ltd.

### Medway School of Pharmacy

Dr Simon Scott has been awarded \$63,832 for a project entitled 'Osteoclasts and Bone Cancer' by the National Institutes of Health (US) vis University of Minnesota.

Dr Tarlochan Gill has been awarded £5,500 for a project entitled 'PCT Commissioning of Pharmacy Enhanced Services in Kent: The Community Pharmacy Perspective' by the National Pharmacy Association Ltd.

### School of Mathematics, Statistics and Actuarial Science

Professor Elizabeth Mansfield has been awarded £296,776 for a project entitled 'Group actions in function approximation spaces' by the Engineering and Physical Sciences Research Council.

Professor Phil Brown has been awarded £4,500 for a project entitled 'Proteomic and Metabonomic Mass Spectroscopy data' by Pfizer Ltd.

### School of Computing

Dr Colin Johnson, Dr Alex Freitas and Professor Simon Thompson have been awarded £307,678 for a project entitled 'Refactoring and neutrality in genetic programming' by the Engineering and Physical Sciences Research Council.

Professor David Chadwick has been awarded €33,308 for a project entitled 'Trusted Architecture for Securely Shared Services (TAS3) (Management and Other)' by the European Commission FP7.

Professor Simon Thompson has been awarded €10,000 for a project entitled 'Pro-Test:Property-based testing (Management and other costs)' by the European Commission FP7.

David Soud has been awarded £2,850 for KITC Support by P De Jager and Sons Ltd.



## January Seminars

Date	Day	Time	Subject	Lecturer and Title	Location
15	Tues	2.30pm	Maths	Carl Bender (Washington University in St. Louis)	Maths LT
19	Tues	2.30pm	Maths	Matthias Langer (University of Strathclyde)	Maths LT
26	Tues	2.30pm	Maths	Karel Casteels (Vancouver)	Maths LT
22	Fri	3pm	Maths	Dr Andy Hone (Kent)	Maths LT
22	Fri	3pm	Maths	Dr Jim Shank (Kent)	Maths LT
27	Wed	2pm	SPS	Louise Frith, UELT and Gavin Mountjoy, SPS	SPS PSLT
27	Wed	4.15pm	CCNCS	Dr Chris Berry, UCL 'A unitary signal-detection model of implicit and explicit memory'	SB110B, Computing

## Conferences

### School of Engineering and Digital Arts Research Conference

The School of Engineering and Digital Arts is pleased to announce that it will be holding its full School Research Conference on January 15th 2010.

The conference will be held in the Pilkington Building at the University of Kent's Medway Campus.

The conference programme may be downloaded from this page:

[http://www.eda.kent.ac.uk/material/pdf\\_docs/eda\\_conference\\_programme.pdf](http://www.eda.kent.ac.uk/material/pdf_docs/eda_conference_programme.pdf).

For further information on the conference, please contact Denyse Menne on 01227 823284 or email: D.H.Menne@kent.ac.uk

### International Statistical Ecology Conference 2010

The National Centre for Statistical Ecology in the School of Mathematics, Statistics and Actuarial Science will host The International Statistical Ecology conference from Tuesday 6th to Friday 9th July 2010 at the University of Kent in Canterbury.

This conference will bring together experts from around the world to discuss topics of interest to ecological statisticians and numerical biologists. We will hold sessions focused upon mark-recapture methods, distance sampling methods, other abundance estimation techniques, monitoring of biodiversity, survey design and analysis for estimating population trends, modelling of spatial trends in animal density, integrated population modelling, stochastic population dynamics modelling, stochastic multispecies modelling, and stochastic modelling of animal movement.

Full details are available on the following link:

<http://www.creem.st-and.ac.uk/ocs/index.php/isec/isec2010/index>





## Anniversary for the Orion Nebula



M42 Orion Nebula  
Mod. Webcam - WO 66 - Baader LRGB Filters

The Orion Nebula is catalogued as Messier 42 (M42, NGC 1976). It is the brightest star-forming nebula in the sky and visible to the naked eye under moderately good conditions. It is prominent in the South during our winter evenings- take a look, it is in the middle of Orion's sword. In a small telescope, you can see four brilliant blue stars called the Trapezium. In the image provided here by Georgios Ioannidis of CAPS, the Trapezium is over-exposed, saturating the pixels, but the surrounding red nebula with green trimmings certainly displays traditional Christmas colours.

Probably known to ancient civilizations such as the Mayans, the Orion Nebula was rediscovered 400 years ago in 1610, by Nicholas-Claude Fabri de Peiresc, a French lawyer, who turned the recently acquired telescope of his patron, du Vair, to the skys. Galileo, mysteriously, overlooked it!

Four hundred years later, the Centre for Astrophysics and Planetary Science still explores the Orion region. Infrared observations have shown that Theta1 C, which is actually the brightest and most massive star in the Trapezium cluster, is a close binary. Using ESO telescopes, the international team, which includes Professor Michael Smith, synthesized a much larger telescope by combining individual 8 metre dishes of the Very Large Telescope. The fundamental parameters of the orbits have been determined (*Astronomy and Astrophysics*, Volume 497, Issue 1, 2009, pp.195-207). The results warranted a press release – see: <http://www.aanda.org/content/view/375/42/lang,en/>

**This superb astronomical image was captured by, Georgios Ionnidis, who is one of the new PhD students to join CAPS.**

*For more information about CAPS, please contact: Professor Michael Smith, Professor of Astronomy, School of Physical Sciences*

**Café Scientifique  
Ye Olde Beverlie,  
St Stephen's Green, Canterbury**

**The next meeting will take place at 7pm—Tuesday 12 January 2010**



### Facial Recognition from page 5

Would you recognise this face from the computer-generated face produced by VisionMetric's software?

In field trials conducted by Derbyshire Police, the software led to twice as many identification of suspects as traditional methods.

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