

Well, it is now one year on from the initial launch of the Informatics CRN newsletter and we would like to take this opportunity to thank all of our contributors and collaborators for their assistance in helping us disseminate research highlights and updates to members of the Network and beyond.

In this issue we bring you an update on developments in relation to: the CRN inSORS® Grid competition; computing cluster progress; a joint Computer Science/Civil Engineering research project on modelling rainfall-runoff; a recent China research visit and funding opportunities.

We are continually looking for newsworthy material so please do send any comments and feedback to:

informatics-crn-enquiries@cs.bham.ac.uk

We hope you enjoy this issue!

Robyn Budge



Prof Vince Gaffney, IAA (centre and top right):
Chairing demo session from his personal node,
with AGSC participation.

Collaborative Research Networks (CRNs) Fund inSORS® Grid Personal Node Competition

To celebrate the launch of the Design Centre, the UoB HP VISTA Centre was donated a number of inSORS® Grid Personal Node licenses (inSORS® Grid is an entirely compatible commercial version of the Open Source AccessGrid® software), which will enable distance collaboration via video conferencing. Participating CRNs subsequently joined forces to run and fund a competition that will see the allocation of a number of inSORS® Grid Personal Node 'packages' (to include software licenses, webcams and echo-cancelling microphones) to successful applications which support collaborative research projects.

The competition (originally advertised in Buzz and online) will provide each of the winning projects with access to the advanced video conferencing facilities provided by a personal node and provide the opportunity to reduce costs and work more closely with collaborators at home or abroad.

A tutorial session for all awardees was held on 27th November 2006 at the HP VISTA Centre, in collaboration with Information Services and external support representatives from inSORS® and the Manchester AccessGrid® Support Centre (AGSC). The informative session provided the opportunity for awardees to meet each other and introduce projects, as well as discuss usage of the software with experts. Awardees are expected to take full delivery of their Personal Nodes in this new year.

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Dr Lawrence Lowe, Physics & Astronomy discussing his project(s) and planned use of the personal node



Mr Mark Lydon, ideas 2 action (i2a) inSORS® Grid Europe Representative with awardees and associates

Collaborative Research Networks Fund InSORS® Grid Personal Node Competition (continued from page 1)

The Informatics CRN has agreed to fund specified equipment for two of the personal nodes: a node in support of Dr Russell Beale's project 'Mobilise', in addition to Prof Peter Watkins and Dr Lawrence Lowe's venture in support of collaborative lecture courses and research in particle physics with Warwick University. We aim to feature developments of these projects in the future.

The awardees are (alphabetical):

Dr Russell Beale

Advanced Interaction Group, School of Computer Science

Project: Mobilise: digital learning, mobile blogging, serious gaming, creative computing, intelligent data-mining

Prof Andrew Chan

School of Engineering, Department of Civil Engineering

Project: to support transport related collaborative research activities

Prof Susan Hunston and Mr Oliver Mason

Department of English, in support of collaboration with University of Erfurt, Germany

Project: Identification of semantic elements in an open corpus

Prof Kate McLuskie

The Shakespeare Institute, Stratford-upon-Avon, in support of the development of the Birmingham Heritage Network

Project(s): Interrogating Value in Literary Heritage; Material Culture and Heritage of Shakespeare's England; Conference on Literary Heritage; and Distance Learning

Prof Taunton Southwood

Institute of Child Health, Division of Reproductive and Child Health, Medical School (collaborative team bid with special thanks to Dr Andrew Peet, Institute of Child Health)

Project(s): HealthAgents: Agent-based Distributed Decision Support System for Brain Tumour Diagnosis and Prognosis and; Development of a Satellite Clinical Research Facility at Birmingham Children's Hospital

Prof Peter Watkins (and Dr Lawrence Lowe)

Particle Physics Group, School of Physics & Astronomy, in support of collaboration with University of Warwick

Project: Collaborative lecture courses and research in Particle Physics with Warwick University

Dr Roger White

Institute of Archaeology and Antiquity

Project: Development of the Birmingham Heritage Network

Prof Alan Wing

School of Psychology

Project: Nano-engineering biomimetic tactile sensors (NANOBIOTACT)

Dr Stephen Young

Division of Immunity & Infection, Institute for Biomedical Research

Project: Clinical Metabolomics Network – the development of multidisciplinary disease diagnosis and prognosis

In addition, one inSORS® Grid Personal Node software license only has been allocated to Information Services for use in a publicly accessible location to facilitate further distance collaborative activities and encourage wider AccessGrid® technology usage across campus.

Congratulations to all winning projects! Special thanks to our software sponsors, VISTA, Information Services and the participating Collaborative Research Networks (CRNs) for the joint funding and support of this competition.



Mr Paul Hatton, IS: driving the AGN session from the VISTA Centre

Read More:

Communication and Communication Technology CRN
Heritage, Cultural Production and Interpretation CRN
Human Disease, Diagnosis and Treatment CRN
Informatics CRN
Molecules and Materials CRN
Transport CRN
Information Services
Visual and Spatial Technology Centre (VISTA)
inSORS®
AccessGrid® Support Centre, Manchester

www.cct.bham.ac.uk
www.heritage.bham.ac.uk
www.hddt.bham.ac.uk
www.informatics.bham.ac.uk
www.molmat.bham.ac.uk
www.transport.bham.ac.uk
www.is.bham.ac.uk
www.vista.bham.ac.uk
www.insors.com
www.agsc.ja.net

Research Computing Cluster Vendor Selected

article contributed by Paul Hatton, Information Services

Clustervision, in partnership with IBM and Fakespace, have been selected as the vendors for the £2.1 million Research Computing facility to be installed and managed by Information Services (this award is subject to final contract negotiations). The facility will include at least 100 TBytes of disk with a sophisticated cluster file system and at least 2000 processing cores. Fakespace will be installing one of their state-of-the-art optical tracking systems in the Visual and Spatial Technology Centre, thereby providing a coherent and integrated facility for all aspects of Research Computing.

The bid to the University was supported by a wide range of research areas including:

- Archaeology and Antiquity
- Chemistry
- Computer Science
- Engineering
- English
- Geography, Earth and Environmental Sciences
- Mathematics and Statistics
- Medical School
- Physics and Astronomy

and making the service accessible to a wide range of disciplines is recognised as being essential for the success of this facility. Examples of how this will be achieved include a graphical interface, possibly web-based, for job submission and the possible installation, following technical evaluation, of the Microsoft Compute Cluster on part of the system, making it available to standard Windows applications such as Excel and Matlab without any specialist cluster knowledge from the application user. Of course, the traditional command-line interface for expert cluster users will also be available.

The service will be released in several phases, with a pilot service on the first phase being released around May 2007. The phased release allows the University to optimise the configuration of the service in line with demand, and also to benefit from the ever-increasing value for money for both processing and storage.

Georgina Ellis, Sales Account Manager for Clustervision, said: "Clustervision are extremely happy with the contract award from the University of Birmingham as recognition of the services and expertise we are able to deliver with our Key Partners IBM and Fakespace. In return we would like to express

our real pleasure in working with one of the UK's leading Universities and look forward to delivering a High Performance Computing Facility and developing a stronger and collaborative relationship with a University known for its award winning Science."

Andy Grant from the IBM Deep Computing Team added: "IBM is very pleased to be working with The University of Birmingham and Clustervision to deliver what will be one of the leading HPC systems in the country. In addition to the hardware, we are also looking forward to engaging with researchers at the University to undertake innovative, collaborative projects that have the potential to benefit both organisations — ultimately it's not about the hardware, but what you do with it that counts."

Read More:

Clustervision: www.clustervision.com

IBM High Performance Computing:

www.ibm.com/servers/deepcomputing/

Microsoft Compute Cluster:

www.microsoft.com/windowsserver2003/ccs/default.mspx

University of Birmingham High Performance Computing: www.hpc.bham.ac.uk

Visual and Spatial Technology Centre:

www.vista.bham.ac.uk

Research Update

The School of Computer Science and Civil Engineering commenced a joint project in mid-2005 on the topic: 'Soft computing based approach for modelling and regionalization of rainfall-runoff process'. The project is funded by a Dorothy Hodgkin Postgraduate Award to Alireza Nazemi, co-supervised by Prof Andrew Chan, Civil Eng and Prof Xin Yao, Computer Science. Here, PhD student Alireza Nazemi provides an update on the project and progress in research to date.

Evolutionary Multi-objective Approach for Calibration and Regionalization of Rainfall-runoff Models

article contributed by Alireza Nazemi, Civil Engineering

Nowadays, rainfall-runoff models are the essential tools for hydrological studies in engineering and environmental sciences due to various hydrological concerns such as flooding and reservoir planning. No matter what the

origin of a particular model is, all rainfall-runoff models can be considered as a mathematical system of parametric equations trying to map from the input information (mainly rainfall) to the output time series (runoff). Therefore, in order to apply rainfall-runoff models, some gauged information is needed in order to calibrate the model parameters for a specific area. However, in many practical situations the amount of gauged information is very restricted or even inaccessible such that the standard methods of calibration based on optimization cannot be applied. In these circumstances, alternative approaches are required for parametric estimation. One of these approaches is known as regionalization (or generalization) frameworks where if no gauged information is available for a specific location, (i.e. the ungauged catchment) an attempt can be made to calibrate the model structure to a large number of gauged catchments and then a functional relationship is to be found between the model parameters and the catchment characteristics. This functional relationship is called regional model. By having the regional model and ungauged catchment's physical characteristics, the model parameters for the ungauged catchment can be estimated. This project tries to tackle calibration and

regionalization problems through the use of evolutionary computation. Preliminary investigations showed that calibration of conceptual rainfall-runoff models is inherently a multi-objective task. Therefore any attempts for regionalizing this sort of model should consider the multi-objective information about the model parameters.

A step in regionalization is the selection of a mathematical engine to perform the mapping between representative model parameters and physical characteristics. In most of the previous works linear regression framework has been implemented. In this study a quasi-linear genetic programming has been employed in which evolutionary process creates a set of nonlinear symbolic expressions combined together in a linear form, and then least square estimator finds the numerical coefficients for each expression. Preliminary results on six different test functions showed that the new technique is much more efficient than the general formulation of genetic programming.

We hope that this study can introduce new insights into the prediction of hydrological events in ungauged catchments, which is now categorized as one of the most vital

environmental issues by several organizations such as International Association of Hydrologic Research and UNESCO. The next step of this study will be the creation of evolutionary based regionalization model based on the new formulation of genetic programming. In addition, different time scales will be applied for calibration and regionalization of the applied models in order to reflect how the information complexity can affect the quality of calibration and consequently the regionalization process.

Read More: Civil Engineering, UoB
www.eng.bham.ac.uk/civil/

Royal Society Fund Research Visit To China

article and images contributed by Prof Xin Yao, Computer Science

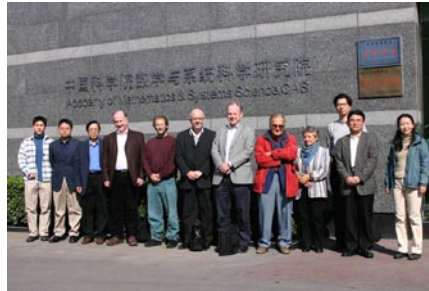
Eight UK scientists recently travelled to China on a research visit funded by the Royal Society, to participate in a number of collaborative research activities.

The first two days of the trip (23–24 October 2006) were spent in Beijing, where Scientists attended seminars and visited three institutions in the Chinese Academy of Sciences: Institute of Computing Technologies, Academy of Mathematics and Systems Science and the Institute of Automation. The trip then moved on to Hefei for attendance at the 2006 China-UK Workshop on Nature Inspired Computation and Applications (CUWNICA'06). The workshop (25–27 October 2006), Co-chaired by Prof Xin Yao, UoB, served as a forum for researchers in both the UK and China to present their results and exchange ideas in natural computation, and strengthen ties between UK and Chinese researchers.

A number of highly topical and important economic, social, scientific and technological issues were discussed in relation to Evolutionary Computation, Artificial Neural Networks, Molecular Computation, Swarm Intelligence Systems, Quantum Genetic Algorithms, Artificial Immune Systems, Artificial Endocrine Systems, and Complex Self-adaptive Systems. Application areas included Machine Learning, Complex Optimized Problem Solving, Intelligent Control, Pattern Recognition, Network Security, Hardware Design, Social Economy and Environment Protection.

Natural Inspired Computation is an emerging interdisciplinary research area between Natural Sciences (especially Life Sciences)

and Computer Science and its rapid growth is a natural product of the rapid development of interdisciplinary research today.



Prof Xin Yao, Computer Science in Beijing with fellow Scientists (3rd from right)



2006 China-UK Workshop (CUWNICA'06) Hefei, China

Read More: nical.ustc.edu.cn/nica2004/
www.nhpcc.ustc.edu.cn/CUWNICA/

Funding Opportunities

High Performance Computing Software Development Call 2007

EPSRC has announced a call for proposals to support HPC software development. This call is a pump priming activity providing an opportunity for investigators to request support for HPC software development projects of up to 18 months in duration. Up to £3 million is available for this call, subject to the quality of the proposals received. Closing date for proposals: 4 pm, 28th February 2007

Read More: www.epsrc.ac.uk/CallsForProposals/HPCSoftwareDev2007.htm

7th Framework Programme (FP7) Information Session & Continuing Opportunities

An FP7 open information session tailored to the field of Informatics was held on 26th October 2006 for members of the Network and any other parties interested in the possibility of submitting bids under the next round.

Representatives from Computer Science (Dr Jon Rowe) and Engineering (Dr Theodoros Arvinitis) were on hand to share their experiences with EU funded projects and provide useful background information on

working within such projects. Additionally Xavier Rodde, European Projects Development Officer, RES (now Research & Commercial Services) provided a presentation on relevant FP7 funding areas, including the new rules concerning the rates of contribution for both direct and indirect costs. The session provided an excellent opportunity for questions and answers with experts throughout and we anticipate that attendees will give further consideration to FP7 funding initiatives.

Read More:
FP7 at UoB: www.res.bham.ac.uk/information/eu/fp7/index.htm
FP7 main website: cordis.europa.eu/fp7/home_en.html

Announcements

The Informatics CRN would like to advise all colleagues that Professor Marta Kwiatkowska has recently been awarded a Chair at Oxford and will be moving from UoB to take up Professorship of Computing Systems at Oxford University Computing Laboratory in July 2007. In line with this development and other commitments, Prof Kwiatkowska will no longer lead the Informatics CRN and a new Academic Champion will be advised in due course.

Read More: www.cs.bham.ac.uk/~mzk/

In a separate development, Robyn Budge, Informatics CRN Co-ordinator has moved on to a new role as Centre Administrator in the recently refurbished Centre for Systems Biology (CSB). The interdisciplinary Centre (based in the Haworth Chemistry building and part of the School of Biosciences) is currently comprised of staff from the School of Computer Science, School of Biosciences and the School of Medicine. It is anticipated that multi-discipline research collaborations will be developed across campus (e.g. with Mathematics, Engineering and others) and the Centre will be a hub for this activity. Please feel free to visit the Centre to have a look and/or express your interest in future collaboration.

Centre for Systems Biology (CSB), School of Biosciences, University of Birmingham, Edgbaston, Birmingham, B15 2TT, UK
Tel: 0121 414 8848 Fax: 0121 414 8844.
Coming Soon: www.csb.bham.ac.uk

Best wishes for Informatics CRN from the outgoing Champion and Co-ordinator!