Appointments

Otago IS

Emmanuela Moreale
Junior Research Fellow
Agent-based software integration

Victoria

Ray Nickson PhD Victoria
Lecturer (from August)
Formal methods in software engineering

Cecelia Buchanan PhD Washington
Lecturer (from October)
Multimedia

Waikato

Lungin Lu PhD Birmingham
Postdoctoral Fellow (from February)
Logic programming, programming tools, intelligent tutoring systems

Auckland

Georgy Gimel'farb PhD Inst Cybernetics, Kiev, Ukraine
Senior Lecturer, CITR, Tamaki Campus (from July)
Computer vision, image processing, digital TV

Visitors

Canterbury

Prof Slobodanka Djordjevic-Kajan (March - May)
University of Nis, Yugoslavia

Professor Biswanath Mukherjee (July - August)
Computer Science, UC Davis, USA
Computer communications and security

Professor Harold Thimbleby (May)
Computing Science, Middlesex University, London
Human-computer interaction

Professor Tsunetoshi Hayashi (August - March '98)
Computer Science, Ritsumeikan University, Japan
Language processors and computer music

Waikato

Dr Abhijit Sen (June '97 - June '98)
Kwantlen University College, BC, Canada
Data communication, software engineering

Auckland

Prof Helmut Thiele (November - December)
University of Dortmund, Germany
Non-classical, especially polyvalent logics, logical systems in artificial intelligence, non-monotonous reasoning and dynamical logics

Dr Ryszard Kozera (November - January)
Computer Science, University Western Australia, Perth
Computer vision, numerical analysis, applied mathematics, partial differential equations

1996 Visiting Lecturer's Report

In 1996 and early 1997, I visited all seven University campuses in New Zealand, in most cases delivering two lectures. In one of my lectures, I described my current research on memory systems. I'm working toward a general model and analytic framework that would allow us to analyse the 'memory cost' of a computation almost as easily as we can now count its 'instruction cost'. If you'd like to read more about this topic, please visit my website <http://www.cs.auckland.ac.nz/~cthombor/Lmh/index.html>

My other lecture at each campus was rather short, consisting of a few slides of statistics from the USA. The statistics show a dramatic decline, since the mid 1980's, in the percentage of undergraduate computer science degrees awarded to women. This decline is prefigured by an equally-dramatic decline since the early 1980's in the gender ratio of the students who expressed interest in entering our major prior to going to University. Please see <http://www.cs.auckland.ac.nz:80/~cthombor/Femcs/femcs.html> for more detail.

Contents

The most interesting part of my visits started immediately after my statistical presentation. I moderated a discussion on "why are there so few women in our major, and what should we do about it?" I found most audiences ready to accept that there is a serious problem of gender imbalance in our major. Most departments had grappled with these issues, at varying degrees of intensity, prior to my visit.

Two departments stand out in my recollection. At Victoria University, there has been a long-standing effort to increase the retention of women in first-year computer science. Despite this, retention was not significantly improved from 1990 to 1996. The Victoria staff finds this disappointing, and of course it is; but I'd hazard a guess that all other computer science departments in New Zealand, except Lincoln University's, have experienced a drop in first-year female retention rate over this same period.

At Lincoln University, I found a Centre for Computing and Biometrics that, in many respects, is a "normal" computer science department. However the staff morale was excellent, the pedagogic focus was more on computing applications than on the usual programming and theory, and the gender balance in the classroom was noticeably better than average.

Summarising my impressions of all departments, I'd say that Computer Science in New Zealand is in remarkably good shape, despite a low base of research funding that depresses the size of our postgraduate programmes. We're all also, I think, in an increasingly difficult situation with more-or-less static teaching budgets, growing undergraduate enrolments, low staff salaries (at least in comparison with the USA), and fairly strong and growing demand for our staffs' talents at higher payrates in private industry and in overseas universities. Taking all this into consideration, I was quite favourably impressed with the research programmes everywhere I visited.

I'd like to take this opportunity of thanking everyone who showed me such warm hospitality during my term as Visiting Lecturer. I must apologise for the lateness of this report; I can only hope it's a case of "better late than never".

Clark Thomborson (Auckland)

Departmental Report

Lincoln

After spending some time working in collaboration with Aoraki (http://www.cardnet.co.nz/aoraki.htm), sponsors of our chair of Applied Computing, Alan McKinnon (http://www.lincoln.ac.nz/ccb/staff/mckinnon.htm) is now on study leave. Initially he spent some time at Vislab at the University of Sydney, working on the visualisation of a model of pollution transfer in aquifers (developed by Don Kulasiri). In October Alan will attend the IEEE conference on "Visu-

alization" in Phoenix, before starting a 2-month study visit to Virginia Tech.

Don Kulasiri (http://www.lincoln.ac.nz/ccb/staff/kulasiri.htm) is to depart on study leave at the end of the year, and he will be spending six months in Mechanics and Computation division at Stanford University, California working on computational and mathematical aspects of environmental systems modelling. He also plans to work with developers in the Advanced Simulation Lab, CACI, La Jolla, California, and US Forestry Service during that period.

In December, Don will be presenting two papers in the ModSim'97 (International congress on modelling and simulation), Hobart, Australia; he will also be presenting two papers in The International Conference on Agricultural Engineering in Bangladesh which is organised by the government of Bangladesh and the Michigan State University. He will be the chair for the sustainable agriculture and modelling session.

In June Keith Unsworth (http://www.lincoln.ac.nz/ccb/staff/unsworth.htm) attended an "International Workshop on Computer Aided Geometric Design" in Crete. Computer Aided Geometric Design may be thought of as the "Mathematics of CAD", investigating the representation and manipulation of curves and surfaces. It feeds directly into the facilities offered by CAD software.

Keith presented a paper on "Convexity-preserving B-spline modification". This problem arose in connection with designing ship hulls, a process which is typically solved by "hand methods". Perhaps the next America's Cup winner will have "Lincoln" curves?

Keith also co-authored another paper on "Matching and choice of parameter in sectional interpolation". This is concerned with the problem of reconstructing surfaces from cross-sectional data, a problem which arises in many fields, most notably perhaps the medical field.

Walt Abell (http://www.lincoln.ac.nz/ccb/staff/abell.htm) is off to Toronto at the beginning of November to attend the WebNet97 conference. He will be presenting a paper on the results of a follow-up study on business use of the Internet in New Zealand.

In August a paper written by Mary Avery, Ryan Clements, Glen Harrison and Ken Hughey was presented at Geocomputation'97 in Dunedin. The paper presented results of a prototype GIS based Walkway Management System developed to aid the Department of Conservation (DoC) in there management of walking tracks.

Alan McKinnon and Clare Churcher (http://www.lincoln.ac.nz/ccb/staff/churcher.htm) have just been awarded a GRIF in collaboration with the Christchurch Press. This is to develop software to produce one or more press configurations that are consistent with the daily page layout requirements.

Elizabeth Post

Publication Web Sites

Auckland

Computing and Information Technology Research Group Technical Reports (16 so far in 1997) on http://www.tcs.auckland.ac.nz/Research/Reports/

Otago IS

A number of Otago Information Science Discussion Papers are now available electronically.

The Publications home page is http://divcom.otago.ac.nz:800/com/infosci/Publctns/home.htm

The DPS page is http://divcom.otago.ac.nz:800/com/infosci/Publctns/complete/dpsall.htm

You can check the Staff Publications pages for final publication details in regard to most of the Discussion Papers: http://divcom.otago.ac.nz:800/com/infosci/Publctns/complete/staffall.htm

Student Programming Competition

On the 26th July 1997, eleven teams of three people entered the Waikato programming competition. There were nine undergraduate teams, one PhD student team and one staff team. The competition was officially for undergraduates—the staff and PhD students entered to keep themselves sharp (and for a bit of friendly rivalry).

The teams were provided with a set of problems, each worth either 15, 50 or 150 points. The three team members had the use of a single PC running Linux and five hours in which to score as many points as possible. Solutions could be submitted in either C or C++ and were judged automatically. Incorrect submissions cost the teams 1/50 of the value of the question. Real-time marking allowed each team to determine their relative position during the competition. The automated marking process provided time-series graphs of the accumulation of points during the competition.

The breakdown of the undergraduate teams included four 2nd year teams, one 3rd year team and four 4th year teams. Much to the surprise of the 4th year teams, a second year team won the competition by a comfortable margin.

The winning team was called "X", and consisted of Jonathan Purvis (2nd year), Matthew Browne (2nd year) and Perry Lorier (1st year). Congratulations team X!

From the outset, opinion was divided over who would triumph among the two senior programming teams. The PhD team, "Saurs" had the age advantage while the staff team, "Greypower", had experience and also had the advantage of age!

Greypower were the first to score points, although the lead was quickly made up by the Saurs. The lead was repeatedly swapped during the contest...

To find out who won, check out the results and graphs of the competition at http://www.cs.waikato.ac.nz/~singlis/progcomp/results.html

Stuart Inglis

On the Move

The Computer Science Department at Canterbury is looking forward to moving into a new building (http://huia.cosc.canterbury.ac.nz/general/new-bldg.html) in the second term of 1998. In the new building, to be shared with the Maths department, Computer Science will have almost three times its current space. The new facilities will be much more suitable for computer labs, and the increased capacity will enable us to remove the remaining limitation of entry from our courses.

Tim Bell

Events

ICONIP'97 jointly with ANZIIS'97 and ANNES'97
Dunedin (Otago IS)   24-28 November '97
This event brings together three separate gatherings into a single conference that will address many aspects of computational intelligence, neural information processing and intelligent information systems and applications. The conference is to be held in Dunedin, with other events planned for Queenstown. Register now with:

> Conference Secretariat
> ICONIP'97
> Department of Information Science
> University of Otago
> PO Box 56
> Dunedin
> Email: iconip97@otago.ac.nz

Unconventional Models of Computation Conference
Auckland (Auckland)   5-9 January '98
This conference is sponsored by the Centre for Discrete Mathematics and Theoretical Computer Science at Auckland University and the Santa Fe Institute, USA. The conference will feature the following invited presentations:

> M. Amos and A. Gibbons (Liverpool)—*Practical implementation of DNA computations*
> A. Ekert (Oxford)—*Quantum algorithms revisited*
> J. Hartmanis (NSF)—Title to be announced
> I. Hunter (MIT)—*Polymer computation*
> H.J. Kimble (Caltech)—Title to be announced
> S. Lloyd (MIT)—*Unconventional models of quantum computation*
> C. Moore (Santa Fe)—Title to be announced
> J. Reif (Duke)—*Bio-molecular methods for computation*

A. Salomaa (Turku)—*Turing, Watson-Crick and Lindenmayer. Aspects of DNA complementarity*

In addition there will be a total of 22 contributed papers. Papers of both the invited and contributed talks will be published by Springer-Verlag, Singapore in the DMTCS Series, and will be made available to participants during the conference.

For further information about the conference see the UMC'98 conference home page at http://www.cs.auckland.ac.nz/CDMTCS/docs/umc98.html

SE:E&P'98—Software Engineering: Education and Practice
Dunedin (Otago IS)   January '98
This conference is intended as a forum for discussion of new and emerging approaches to software engineering and how best to impart the knowledge of software engineering principles to present and future practitioners. It provides an opportunity for exchanges of ideas and to report on achievements by experts active in the field. Major themes: the Internet, intranets and Java; use and development of distributed and multi-agent systems; new modelling paradigms for systems and software; formal and informal software engineering approaches, methodologies and tools; curriculum design and reviews of existing delivery methods. For information contact:

> Conference Secretariat
> SE:E&P'98
> Department of Information Science
> University of Otago
> PO Box 56
> Dunedin
> Email: seep98@otago.ac.nz
> www: http://divcom.otago.ac.nz:800/com/ infosci/SECML/LAB/Seep98/ CALL1a.htm

TFCV'98
(Auckland)   16–20 March '98
Featured in November 1996 Newsletter.

Conference Report

GeoComputation '97—9th Annual SIRC Colloquium
Dunedin (IS Otago)   26-29 August '97
The 2nd annual international conference on Geocomputation was hosted recently by the Spatial Information Research Centre at the University of Otago. Participants from as far afield as Norway, Israel, Germany, the UK and the USA enjoyed the beautiful weather in Dunedin while discussing the multidisciplinary field of geocomputation. The three keynote speakers, Bill Macmillan, Dave Abel, and Brian Lees, gave stimulating addresses on the meaning of the term geocomputation, use of the world wide web for accessing spatial data, and data questions for geocomputation respectively, provoking much discus-

sion among the conference delegates. Discussion was further facilitated by the enjoyable social events that took place during the conference. All in all everyone at the conference had an enjoyable time and left Dunedin looking forward to next year's conference in Bristol.

Postgraduate News

Auckland

Tim Stucke and Robert Amor recently completed all requirements for their PhDs. Stucke was enrolled in Electrical and Electronic Engineering, but he was co-supervised by Dr Alan Creak of Computer Science. His dissertation title is *"The Mind's Eye: Seeing Structured Multiform Objects"*. Amor was supervised by Dr. John Hosking. His title is *"A Generalised Framework for the Design and Construction of Integrated Design Systems"*.

Chi-Kou Shi and Holger Thiele recently joined our PhD Programme. Their supervisors are (resp.) Professors Calude and Klette.

We have approximately 15.0 FTE enrolments in our PhD programme this year: twelve full-time students and six half-time students.

Prof Clark Thomborson

Masters Theses

Otago IS

1997
> Alec Holt—*Applying case-based reasoning to spatial phenomena*
> Linda Lilburne—*Integration of modelling and GIS*
> Jared McDonald—*The effects of the Internet on a non-English speaking culture*

Canterbury

1997
> J.G. Anstice—*A pen-input computer music editing system*
> S. Yeates—*Design patterns in garbage collection*

Victoria

1997
> Jack Zhang—*Text generalization for editing by demonstration*
> Simon Pohlen—*Maintainable concurrent software*
> Simon McAuliffe—*Transparent multiprotocol network security*
> Anja Martel—*A group replacement algorithm for Web caches*

Teijo Holzer—*Automatic performance measurement of task allocation*

Milton Ngan—*Three dimensional vascular reconstruction from bi-plane angiograms*

1996

Kris Bubendorfer—*Resource based policies for load distribution via process migration and initial placement*

Waikato

1997

Jason Calvert—*Design of the execution control structure for the 'WarpEngine' optimistic CPU*

Wallace Chigona—*The development of a task-specific visualisation tool: TBVS*

Ross Oliver—*Software implementation of a model to detect 2D image motion*

PhD Theses

Otago IS

1997

Xiaodong Li—*Alternative architectures for connectionist computation*

Victoria

1996

James Noble—*Abstract Program Visualisation* **(correction from April Newsletter, PhD not MSc)**

Waikato

1997

Matthew Melchert—*Analysing communication patterns in CSP processes using channel graphs*

Auckland

1997

Tim Stucke—*The mind's eye: seeing structured multiform objects*

Robert Amor—*A generalised framework for the design and construction of integrated design systems*

M. Boehm—*Modelining and recognition of formulars* **(Maths Department, University Potsdam), supervised by Prof Reinhard Klette**

G. Ulich—*Numerical methods in shape from shading* **(Maths Department, Technical University Berlin), supervised by Prof Reinhard Klette**