

centre for health informatics
annual report 07



THE UNIVERSITY OF
NEW SOUTH WALES

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what we do

Post-genome the next healthcare revolution is in information and systems, or informatics. Building a sustainable health system for the 21st Century will require the reinvention of much of the present day system, and require the intelligent use of information and communication technologies to deliver high quality, safe, efficient and affordable health care.

The Centre for Health Informatics (CHI) is Australia's largest academic research group in this emerging discipline. **CHI conducts fundamental and applied research in the design, evaluation and application of decision-support technologies for healthcare and the biosciences.** To do this, we need to model the complex nature of health systems and the bioscience research enterprise, and design scientifically rigorous and system wide interventions to sustain tomorrow's health system.

The Centre's work is internationally recognized for its groundbreaking contributions in the development of intelligent search systems to support evidence-based healthcare, developing evaluation methodologies for IT, and in understanding how communication shapes the safety and quality of health care delivery.

Centre researchers are also working on new models for consumer driven e-health, safety models and standards for IT in healthcare, mining complex gene microarray, medical literature and medical record data, building health system simulation methods to model the impact of health policy changes, and developing novel computational methods to automate diagnosis of 3-D medical images.

A research centre of the University of New South Wales, supported by the Faculty of Medicine, the Centre for Health Informatics is a research partner to major healthcare providers, research institutions and governments, including the New South Wales Department of Health, the National Institute of Clinical Studies and The Commonwealth Department of Health and Ageing.

CHI will drive these changes in healthcare and biomedicine by making contributions to:

SCIENCE

break-through discoveries in information, communication, cognitive and organisational science needed to support health service innovation at a system level

POLICY

providing expert input and leadership into government, shaping policy priorities and goals

INNOVATION

invention of novel technologies and methods that can transfer into industry and health services

EDUCATION

training future researchers through research degree programs to educate clinicians, technologists and policy makers in health informatics

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director's report

The UNSW Centre for Health Informatics remains Australia's largest, longest running and most successful academic health informatics research group. **CHI conducts fundamental and applied research in the design, evaluation and application of decision-support technologies for healthcare and the biosciences.** It has a long and successful research grant track record with both the ARC and the NHMRC, and carries out multidisciplinary research across the Faculties of Medicine and Engineering. Its focus on decision support is also a unique national strength, and widely recognized internationally.

Our research program continues to develop in response to emerging technologies, and evolving health priorities. We have for many years focussed on improving the quality of decision making by clinicians, but have now begun to turn our focus to consumer decision-making. With significant funding support from the HCF Health and Medical Research Foundation, we are now undertaking a major new program of research. We are exploring the design and evaluation of a new 'Facebook for Health' system that will bring together many emerging elements from Web 2.0 like social computing, Wikis, blogs, and embedded and context sensitive information retrieval. Our goal is to develop tools that support consumers in the decisions they face as they interact across the health system.

In 2007, we also consolidated our investment in translational bioinformatics, exploring how the fruits of the genome and bioscience revolution will translate into clinical practice. We are extremely fortunate to have a strong partnership with the ICPMR at Westmead Hospital, and infectious diseases are a core focus for our

translational bioinformatics work, as well as our ongoing work in infectious diseases surveillance systems.

We this year are refreshing our long standing research partnership with clinicians at the Prince of Wales Hospital, and have started a new project, with Australian Research Council funding, to develop tools to understand the impact of communication practices like handover on patient safety, and to undertake some design and testing of new information system components which can support clinical team communication.

Patient safety is a major thread in much of our research at the Centre, and we are also now well underway with our studies of the impact of computerized system to support prescribing, working with clinical partners at St. Vincents Hospital. We have this year also built a new and fruitful partnership with the Australian Patient Safety Foundation, and have begun several studies of their critical incident databases, which will be of international significance when completed.

One of the major challenges for all academic research organisations is sustainability and critical mass, and this year we undertook to form a new Institute of Health Innovation, which will bring together a number of key health services research and related organizations, under a single banner, in 2008. CHI will retain its research identity and focus in the new Institute, but we anticipate significant opportunities to work more closely with our sister research organisations, and to pool resources to undertake much larger research programs. The arrival of the Institute is likely to be a major milestone in our Centre's history, and is one we look forward to, as it is the harbinger of even greater things for us.

2007 Key Performance Indicators:

- We were **awarded \$1,150,355 in new grants**, comprising \$988,855 from the HCF Health and Medical Research Foundation, \$120,000 from the Cerebral Palsy Institute, \$30,000 from a UNSW Medical Faculty Research Grant and \$11,500 from a National Breast Cancer Centre contract.
- In 2007, our research generated **31 publications**, with 13 international journal papers, 16 conference papers and presentations and 2 book chapters.
- Our research staff gave **seven invited presentations** including Keynote or invited addresses at the Canadian Anaesthesiologists' Society Annual meeting Calgary, Alberta; the Australian Red Cross Blood Service Transfusion Update in Adelaide; a Masterclass at the 3rd International Conference On Information Technology in Health Care; the Healthconnect Tasmanian e-Health Expo in Hobart; the Financial Review 9th Annual Health Congress in Sydney; the National Institute of Clinical Studies, Emergency Care Community of Practice presentation in Sydney; and the Sax Institute 2007 health policy and research exchange, in Sydney.
- CHI **research featured in the press and news wires** with articles including "Online search may risk health", *News.com.au*, 31/12/07, "Online Health advice warning", *Canberra Times*, 20/12/07; "Net surfers believe what they want *New Zealand Herald* 21/12/07; Internet strengthens our biased point of view", *AAP News*, 19/12/07;
- CHI underwent a **UNSW Centre Review**, the first formal review of the Centre since its inception in 2000, which recommended the continuation of the Centre's charter and reported positively on the Centre's research contributions and its management processes.

partners and major funders

We are grateful to our partners and funders for their ongoing support of our research programs. CHI's research is supported by the following organisations:

- > NSW Health
- > Australian Research Council (ARC)
- > National Health and Medical Research Council (NHMRC)
- > Federal Department of Health & Ageing
- > HCF Health and Medical research Foundation
- > The Cerebral Palsy Institute

Highlights & Achievements 2007

- CHI successfully hosted the **Third International Conference on Information Technology in Health Care: Socio-technical Approaches (ITHC 2007)**, which was held in Sydney over August 29-20, 2007. The conference brought together an international contingent of researchers studying the relationship between technical aspects of information systems in health, and the human, social, and organizational dimensions.
- We presented four full papers and a panel on patient safety and informatics at the **World Congress for Medical Informatics (Medinfo)** held in Brisbane. The paper by Annie Lau on internet searching biases was nominated for best paper. CHI hosted a large booth at the trade show, showcasing the Centre's research. Prof. Coiera was a member of the Congress organizing committee and was elected as Vice-president (medinfo) for the next triennium of the International Medical Informatics Organisation (IMIA).
- We were awarded a **\$1 million dollar grant to create a 'Facebook' for healthcare by the HCF Health and Medical Research Foundation**. Researchers at the Centre for Health Informatics will be working to combine internet search technology and social networking methods, familiar from sites such as Facebook and MySpace, to help consumers manage their our healthcare.
- Our work with the Smart Internet CRC to develop a **team handover support system has been commercialised** by iClinix, after further development at the John Hunter Hospital, and was formally launched in May 2008.
- **Annie Lau's doctoral thesis** on the impact of cognitive biases on information searching and decision making was awarded. Annie's thesis describes ground-breaking work which explores the way people use search engines to make decisions about their health. Her specific focus has been on demonstrating how well known cognitive biases distort the way people read information and then make decisions.
- CHI held the first in a series of **Short Courses in Health Informatics**. The first course on Clinical Decision Making was held over 23 and 24 November, 2007. It provided an overview of the field of decision-making in healthcare and introduced current 'hot' clinical decision support research topics through presentations and demonstrations.
- Sata Busayarat, a PhD student working with Dr Tatjana Zrimec, won the **IFMBE Young Investigator** competition (International Federation for Medical and Biological Engineering) at MEDICON 2007 from a field of 12 finalists. Sata's presentation was titled "Lung Surface Classification on High-Resolution CT using Machine Learning".
- Prof. Coiera was invited to join the **Executive Committee of the Australian Health Information Council (AHIC)**, the peak national policy body reporting to the Australian Health Ministers via the Australian Health Ministers Advisory Council (AHMAC) on information management and communications technology development in the health sector.
- We hosted a **senior academic sabbatical for Dr Jos Aarts**, from Erasmus University in Holland, who worked with us on our safety and evaluation program for 6 months. CHI also hosted two Danish Master's students from Aalborg University and a German practicum student, all here for approximately 6 months.



research programs

clinical communication

Researchers at CHI have over the last decade been widely recognized for their research into health care organisation communication. We have highlighting the importance of this topic¹, developing theoretical models to help understand communication^{2,3}, developed observational methods to measure communication processes⁴, and contributed basic research that specifically highlights the very high communication loads under which health care workers operate⁵⁻⁷.

Traditionally health informatics research has focused on information system design, with an emphasis on the representation and storage of information, for example the health record. The support of communication has received little attention, despite the fact that up to 90% of the information transactions in some health services do not involve stored electronic data, but rather the exchange of information between clinicians, often in face-to-face conversation. However, our understanding of the importance of supporting effective communication in health care is growing. Health care is not always safe or effective, and the role of poor communication in generating avoidable error and poor outcomes is now widely discussed. For example, we have argued that highly interruptive media such as the pager and the telephone, often the main means for communication between health professionals, can cause memory disruptions and lead to errors³. Since communication inefficiency and failure may be a core generator of clinical error, supporting more effective

communication practices may have a great impact on the quality and safety of health service delivery.

Highlights of our program this year include:

- Our work on team handover systems with the Smart Internet CRC has been commercialised by iClinix, after further development at the John Hunter Hospital. The formal product launch took place in May 2008.
- We completed our studies of communication and its impact on clinical error, funded by HCF Health and Medical Research Foundation, in partnership with the University of Sydney. The work involved observing 40 doctors working in an emergency department and has shown for the first time how interruptions can result in significant disruptions of clinical work.
- We commenced a new research program, in partnership with the Prince of Wales Hospital, and funded under the ARC Linkage program, to study the relationship between poor communication practices, patient safety and clinical error, and looking to design new systems to support communication. While maintaining an initial focus on handover, the project will explore team communication support broadly across a variety of different hospital ward settings.

Contact: Enrico Coiera

1. Coiera E. When conversation is better than computation. *Journal of the American Medical Informatics Association*. 2000;7(3):277-286.
2. Coiera E. Mediated agent interaction. In: Quaglini BaA, ed. *8th Conference on Artificial Intelligence in Medicine*. Berlin: Springer Lecture Notes in Artificial Intelligence No. 2101; 2001.
3. Parker J, Coiera E. Improving Clinical Communication: a view from Psychology. *Journal American Medical Informatics Association*. 2000;7:453-461.
4. Spencer R, Logan P, E C. *Communication Observation Method (COM) Manual*: Centre for Health Informatics, UNSW; 2002.
5. Coiera E, Tombs V. Communication behaviours in a hospital setting: an observational study. *British Medical Journal*. 1998;316:673-677.
6. Coiera E, Jayasuriya R, Hardy J, Bannan A, Thorpe M. Communication loads on clinicians in the emergency department. *Medical Journal of Australia*. 2002;176:415-418.
7. Spencer R, Coiera E, Logan P. Variation in communication loads on clinical staff in the emergency department. *Annals of Emergency Medicine*. 2004;44:268-273.

safety and evaluation program

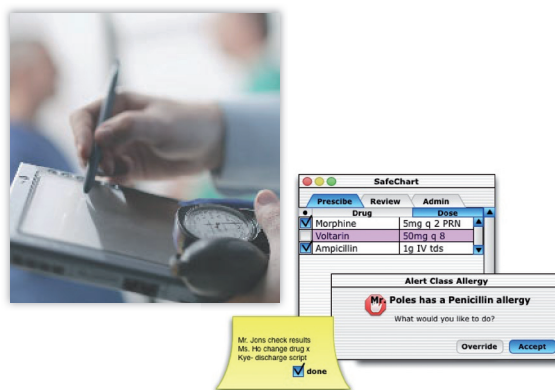
System safety is critical to the success of the large-scale computerization being undertaken to improve the quality of health services delivery worldwide. Indeed, most of the benefits of health ICT implementation will come from using clinical decision support systems (CDSS). Modelling by Australia's National E-health Transition Authority (NEHTA) estimates that 50% of the projected \$50 billion in national benefits of IT implementation, measured by safety, quality of care, and financial efficiency, will come from CDSS.

However, CDSS may also pose a risk to patient safety⁸. Several recent studies have identified the potential of CDSS to generate new errors⁹. In 2003, the US Pharmacopeia, a drug industry standards group which monitors safety, reported that 20% of medication errors were computer related. A large proportion of these were due to data entry error and user distraction. Software currently developed for health settings does not support complex work, multitasking and interrupt driven clinical environments.

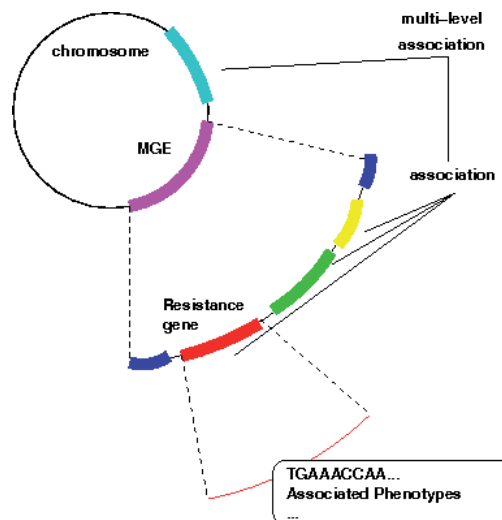
The safety of CDSS is poorly understood amongst researchers, and continues to be a neglected policy area as standalone clinical software which requires manual data entry is currently not subject to any regulation in Australia or overseas. Computer errors associated with the use of unregulated clinical software represent a significant risk to patient safety, but as yet there has been limited effort devoted to understanding such errors and designing safer systems.

Our Clinical Systems Safety Engineering research program is focusing on understanding the ways in which ICT is both an enabler of safer clinical practice, and also understanding the ways in which ICT can unintentionally be the generator of new types of error. Our research aims to use this rich understanding of the way ICT impacts safety to develop innovative tools and methods that ensure the safety of clinical information systems. We employ specific theoretical approaches from novel accident models to cognitive load theory to design exemplar safer systems which minimize the impact of human error and system failure. The specific focus of the program is on CDSS, including an examination of the medication management and prescribing processes to ensure that the outcomes of this research will have immediate impact on patient safety in routine care¹⁰. We also wish to influence policy in this area, and begin a debate about the best mechanisms to ensure that clinical software is safe, and does not inadvertently result in patient harm or misadventure¹¹.

Contact: Farah Magrabi



8. Ash JS, Berg M, Coiera E. Some unintended consequences of information technology in health care: the nature of patient care information system-related errors. *J Am Med Inform Assoc.* Mar-Apr 2004;11(2):104-112.
9. Coiera E, Westbrook JI, Wyatt JC. The Safety and Quality of Decision Support Systems. *Methods Inf Med.* 2006;45(1):S20-25.
10. Toussaint P, Williamson M, McDonnell G, Nytro Ø. Modeling the Communications Dimension of Clinical Work and Medication Errors. *The 24th International Conference of the System Dynamics Society.* Nijmegen, The Netherlands; 2006.
11. Coiera EW, Westbrook JI. Should clinical software be regulated? *Medical journal of Australia.* 2006;184(12):600-601.



translational bioinformatics

Translational bioinformatics is the use of bioinformatics and computational biology tools in support of clinical practice.

Our program is currently focussing on developing tools to help clinicians and public health officials make informed decision about infectious diseases with rapidly changing antibiotic resistance profiles. Antibiotic resistance in bacteria is a growing public health problem of major significance in both the developing and developed world. The limited development of new antibiotics over the last three decades, and the emergence of many new multi-drug resistant organisms (“super bugs”), has meant that our ability to treat infections is diminishing. The WHO General Assembly recently named antibiotic resistance as one of the top three global health threats. Resistant infections are linked to excess health costs especially in ICU, and are associated with a two-to-threefold excess mortality. More than half of the nosocomial infections in the US (more than 2 million per year) are attributed to antibiotic-resistant bacteria, with increased costs of up to USD \$50 billion annually (this equates to about AUD \$2.5 billion, in our population).

The spread of resistance between different species is driven by specific bacterial mechanisms for genetic recombination and transmission via mobile genetic elements (MGEs). MGEs have complex higher order genetic structures, and are not easily detected by contemporary sequence level bioinformatics methods. Consequently,

our ability to track the spread of resistance patterns, and formulate appropriate public health responses, is severely limited. Our project goals are to develop information systems capable of automatically discovering and then tracking these genetic patterns from local and global datasets, and supporting clinical treatment decisions about antibiotic selection.

Over the last 12 months we have developed a unique hierarchical gene annotation system; the world’s first such system capable of automatically and accurately annotating complex structures in bacterial DNA, thanks to a unique grammatical analysis method. We have also used our genetic grammars to assist in the discovery of previously unidentified genetic structures, and have identified a number of new gene cassettes amongst gram-negative bacteria. Working with our research partners at the ICPMR at Westmead Hospital, our software has been used to undertake the largest and most comprehensive review of gene cassettes amongst gram negatives ever undertaken – a formidable task that would not be possible with out the specialized tools developed by our team.

Contact: Guy Tsafnat

public health surveillance

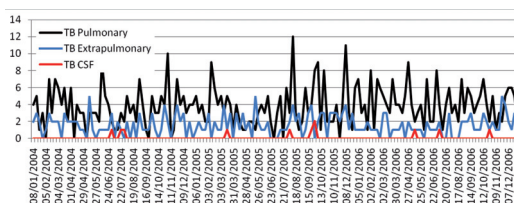
Recent outbreaks of re-emerging and new communicable diseases have highlighted inefficiencies in public health monitoring and control systems. The growth in multi-drug resistant strains, the threat posed by bioterrorism and current patterns of international travel have heightened concerns about the social and economic costs of infectious diseases, challenging and modifying the field of biosurveillance. Our program of biosurveillance research is focused on informatics approaches to optimizing risk assessment and response to outbreaks of communicable diseases and addresses the need for improvement in the timeliness and specificity of early detection and control of biothreats.

New sources of disease-specific and related data, including syndromic health indicators, microbial molecular profiles, and global epidemiological information continue to emerge thanks to recent breakthroughs in high-throughput molecular profiling of micro-organisms and text mining as well as to the growing electronic sources of knowledge about the molecular epidemiology of pathogens with epidemic potential. These emerging infectious disease signals can be combined to address many of the inefficiencies of traditional surveillance

systems. At CHI we have been developing new models of outbreak detection and risk assessment that utilise these new sources of information and integrate them into public health-decision making¹²⁻¹⁵.

Specific research projects include:

- Design of epidemic footprints for the main infectious disease syndromes. These footprints can be used as filters to distil relevant information from the background noise in a population and trigger focused and rapid testing of patients with severe infection, enhancing laboratory investigations.
- Creation of operational definitions of an outbreak using temporal and spatial clustering of pathogen genotypes. These definitions utilise innovative bacterial genotyping technologies to enhance early warning systems by aiding the detection of moderate and small epidemics.
- Development and analysis of state-of-the-art statistical methodologies for the detection of infectious disease outbreaks. These tools are tailored to specific pathogens and populations at risk and are evaluated using pathogen genotyping data as well as simulations of synthetic outbreaks.



12. Sintchenko V, Iredell JR, Gilbert GL. Genomic profiling of pathogens for disease management and surveillance. *Nat Microbiol Rev* 2007;5:464-470.

13. Sintchenko V, Gallego B, Chung G, Coiera E. Towards bioinformatics assisted infectious disease control. In: Summit on Translational Bioinformatics; 2008 10-12 March 2008; San Francisco, USA: American Medical Informatics Association; 2008. p. 105-109.

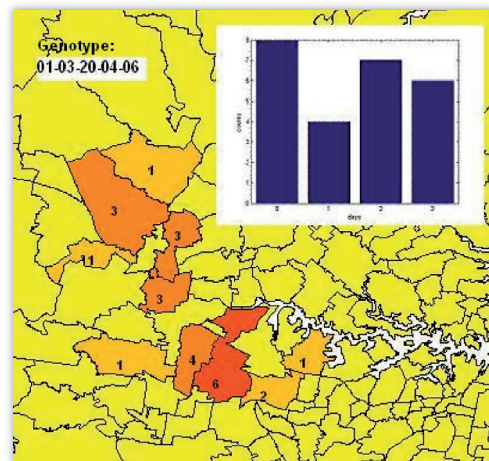
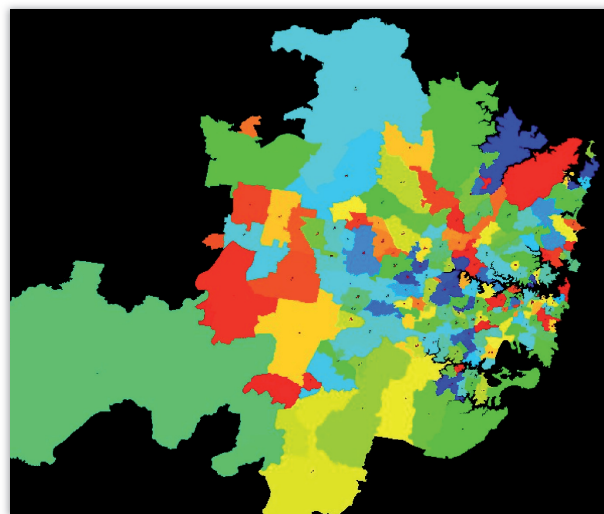
14. Sintchenko V, Gallego, B, "Laboratory-guided detection of disease outbreaks: three generations of surveillance systems". *Archives of Pathology & Laboratory Medicine*, in press, 2008 [Accepted Jan 2008].

15. Wang Q., Sintchenko V., Gallego B., Kong F., and Gilbert G., "Early Warning System for Foodborne Outbreaks Based on Multiple Locus Variable Number Tandem Repeat Analysis (MLVA) of Salmonella Typhimurium and Temporospacial Clustering", Proceedings of the Conference on Emerging Technologies of Medical Importance for the Diagnosis of Infectious Diseases and Detection of Pathogenic Microbes.

Our work is also focused on one of the main barriers to the efficient monitoring of, and response to outbreaks, namely suboptimal and delayed decision-making, by providing new modes of decision support and integration of complex surveillance signals into action plans. Innovative analytic approaches using Bayesian classifiers and direct data based pattern recognition and clustering methods are applied to build rule-based decision support systems for clinical and public health assessments. This research also extends our current development of machine learning algorithms to provide patient-specific recommendations based on the molecular typing of bacteria with epidemic potential.

Our biosurveillance research is collaborative, working with those involved in epidemiological and clinical data collection as well as laboratory-based work. We have strong links with the NSW Department of Health and the Centre for Infectious Diseases and Microbiology, Institute of Clinical Pathology and Medical Research Network, Sydney West Area Pathology Service.

Contact: Blanca Gallego-Luxan



biomedical text mining

Text mining research exploits computational approaches to natural language understanding and machine learning to extract information from text data such as patient records or biomedical journal papers.

Our current focus is to develop methods that support good decision-making by clinicians and consumers using biomedical text mining methods. Over the years, evidence-based decision-making has been hampered by a massive expansion of the volume of 'evidence' documented in text books, clinical practice guidelines, and the scientific research literature. The goal of biomedical text mining is to use computational methods to locate relevant facts embedded in free textual descriptions. Natural language understanding facilitates text mining in interpreting and deriving the meaning of texts, and can therefore be used to identify the most pertinent and high quality evidence.

To date, our work primarily concerns the automated machine extraction of experimental methodology and outcomes of randomized controlled trials. In the past year alone, around 20,000 randomised controlled trials (RCTs) have been conducted; around 11,000 have been indexed in PubMed. Clearly, keeping up to date with publication rates is an enormous challenge. Critical information extracted from RCTs can be used as metadata to index reports, improving the performance of information retrieval thus making it easier for users to find relevant studies. Advanced applications

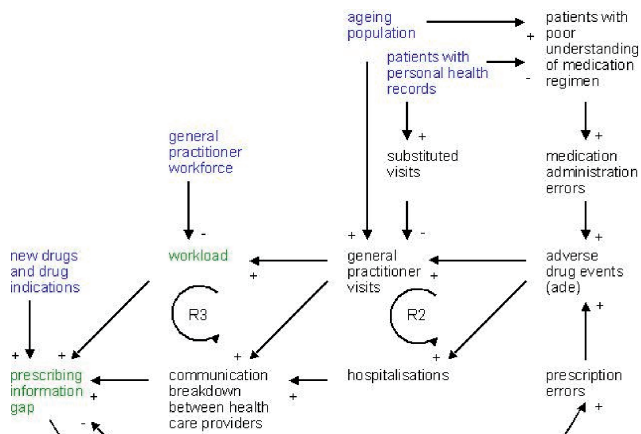
could synthesize extracted facts into concise automatically generated summaries.

At present, we are developing algorithms for robustly recognizing from a free text report, the size of a study population, the intervention arms being compared in an RCT, and the experimental finding of an RCT. These are essential elements that a clinician or a systematic reviewer would look for when appraising the relevance and reliability of an RCT. Furthermore, we are also examining methods for automatically detecting potential harms of a drug intervention, reported in the RCT literature.

The methods we are developing involve statistical techniques for classifying sentences in RCT abstracts into semantic categories. Linguistic methods such as deep and shallow parsing are applied to derive features such as parts-of-speech and additional contextual information as input to machine learning methods that model syntactic and semantic constructs expressing the study population and the allocation of a treatment to each intervention arm. Initial experiments attained an F-measure of 0.86 for finding the total size of patient populations in trials and an F-measure of 0.78 for locating the allocation of intervention comparisons.

Contact: Enrico Coiera

Unlike other **antiarrhythmic class I drugs** showed in preliminary studies, benefits also in **patients with left ventricular dysfunction**. These positive results have induced the development of large randomised controlled studies: their results are reviewed and the controversial points are discussed. In a meta-analysis of randomised controlled trials the use of **amiodarone in heart failure was associated with an approximate 20 to 25% reduction in deaths**. However, **amiodarone was also associated with a 120 to 124% increase in side effects**.



health systems simulation

Many problems which face the health system are complex, dynamic, and cannot be reduced to a single or linear cause and effect relationship. Investigating alternative policy options and hypotheses under these conditions is difficult with current evaluation methods such as randomised controlled trials. These evaluations are often inadequate in terms of time, cost, resources, coverage, transferability across settings and may be unethical or too risky to conduct.

Health systems simulation is the application of modelling and computer simulation methods to study how the interactions between individuals and/or system components over time produce the behaviour observed in the health care system. Health system simulation helps develop an understanding of the systemic causes of problems, and allows for testing of proposed health system interventions.¹⁶

Health systems simulation provides a means to test competing policy options and analyse complex systems in a risk free environment. It can be used to design safe and effective health policies and can make the evaluation process more efficient by directing more appropriately designed trials.

Current health system simulation projects at the Centre for Health Informatics examine medical workforce policy and health information technology policy for medicines use.

The first project uses health systems simulation to aid medical workforce policy. Research has projected a shortage of general practitioners in the Australian workforce and

mounting evidence of a similar shortage of workers in other health areas. Possible policy options to address the medical workforce shortage include training more staff, task substitution and transfer, and new classes of health workers. Each option will have feedback effects and other consequences on the health system that will need to be considered. This project will test the impact of a medical workforce simulation, developed with the System Dynamics modelling method, on making simple and complex decisions about medical workforce policy.

The second project uses health systems simulation to evaluate competing electronic health record models for improving the use of medicines and reducing medication incidents in the elderly living at home. The incidence of administration and prescription errors in the elderly living at home is a growing concern. This problem will worsen with contextual factors such as the ageing population, drug advancements, general practitioner workforce shortages and poor information management and communication. Electronic health records, taking the form of either the personal health record or the shared electronic health record, could improve the use of medicines. A multiscale simulation, developed by integrating System Dynamics and Agent Based modelling methods, will be used to analyse changes to the use of medicines under different contexts and aid the evaluation of alternative electronic health record models.

Contact: Geoff McDonnell

16. Lyell D., Sadsad R. & Georgiou A. (2008) Health Systems Simulation. IN Wickramasinghe, N. & Geisler, E. (Eds.) Encyclopedia of Healthcare Information Systems. Medical Information Science Reference.

statement of financial performance

statement of financial performance for the year ended 31 december 2007

	2007	2006	Notes
	\$	\$	
Income			
External Funds	1,082,865	1,326,109	1
Faculty Contribution	491,797	515,496	
UNSW Contribution	67,450	286,131	2
Total Income	1,642,112	2,127,736	

Expenses			
Payroll	1,154,282	1,722,602	3
Equipment	18,897	31,366	
Materials	154,524	340,328	4
Travel	51,364	54,167	
Total Expenses	1,379,067	2,148,464	

Operating result	263,045	-20,728	
Surplus(Deficit) Bfwd from Prior Year	993,939	1,014,667	5
Accumulated Funds Surplus(Deficit)	1,256,984	993,939	

Notes to the Statement of Financial Performance

1. Reduction in income due to departure of the Evaluation Team headed by Prof. Johanna Westbrook in October 2006
2. Fellow support program
3. Three Research Fellow and three PhD vacancies not filled for most of the year
4. Reduced expenditure as a result of a smaller team through 2007
5. Surplus brought forward from prior year (in 2006) adjusted to reflect balance in UNSW ledger

Faculty In-kind Contributions

1. Faculty of Medicine: provision of office space to house Centre of Health Informatics, at UNSW Cliffbrook Campus (Buildings: Cliffbrook House – CC1, CC2, CC3)
2. Faculty of Engineering, School of Computer Science: space to house VisLab, the computational visualization laboratory supporting our imaging research program

management committee

Committee Role

The management committee's role is to monitor the financial performance of the centre and ensure that the business objectives of the centre are pursued. The committee meets at least three times a year and meetings are minuted and distributed to committee members.

Committee Members

Professor Denis Wakefield (Chair)

Professor Terry Campbell (Past Chair)

Professor Paul Compton

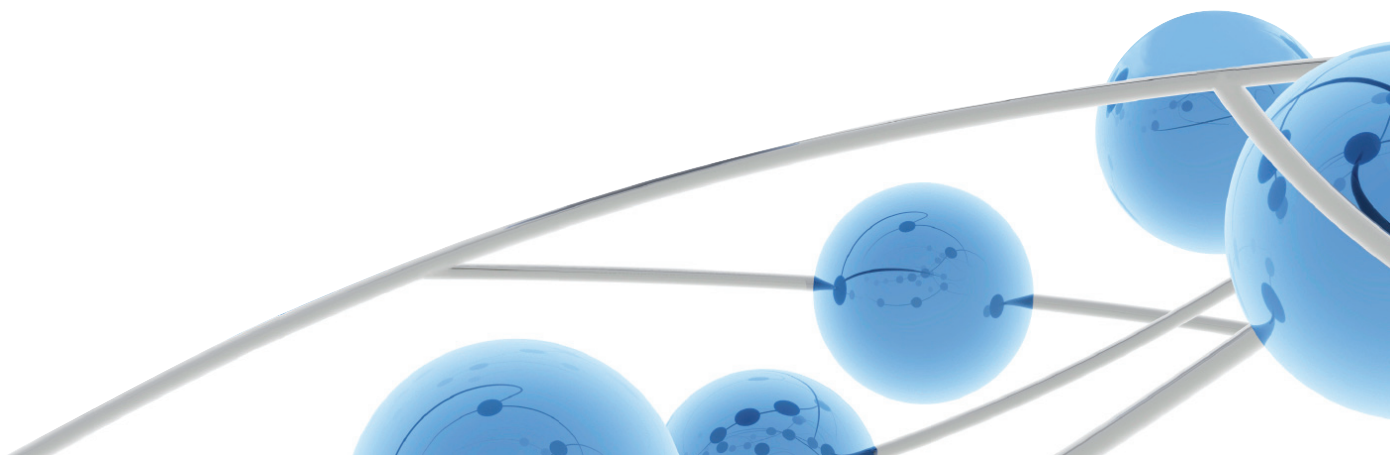
Professor Gavin Andrews

Committee Meetings 2007

7 May 2007

17 September 2007

26 November 2007



staff



Professor Enrico Coiera
Director



Dr Tatjana Zrimec
Senior Lecturer



Gerard Viswasam
Business Manager



Dr Grace Chung
Senior Research Fellow



Dr Guy Tsafnat
Senior Research Fellow



Dr Blanca Gallego
Research Fellow



Dr Farah Magrabi
Senior Research Fellow



Dr Geoff McDonnell
Research Fellow



Victor Vickland
Research Fellow



Dr Vitali Sintchenko
NICS Research Fellow



Jance Ooi
Administrative Assistant



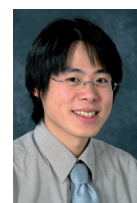
Denise Tsiros
Administrative Assistant



Mahmood Akhtar
Research Associate



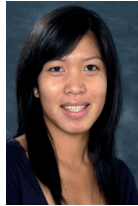
David Lyell
PhD Candidate



Frank Lin
PhD Candidate



Mei Sing Ong
PhD Candidate



Rosemarie Sadsad
PhD Candidate



Zafar Hashmi
PhD Candidate



Gisele Azambuja
PhD Candidate



Jaron Schaeffer
PhD Candidate



Afra Held
Visiting Student

Ashwin Srinivasan
Visiting Fellow

Marie Juul Hansen
Visiting Masters Student

Jos Aarts
Visiting Fellow

Nana Rasmussen
Visiting Masters Student

grants

Capacity Building Infrastructure Grants Program Round 2

Funding source:	NSW Health
Investigator:	Professor E Coiera
Funds:	2006 \$234,041
	2007 \$459,058
	2008 \$446,755
	2009 \$221,738

Agent-based methods for communication system design in complex organizations

Funding source:	Australian Research Council (ARC) Linkage Grant LP0775532
Investigators:	Professor E Coiera, Professor J Westbrook, Professor W Wobcke, Dr F Magrabi
Funds:	2007 \$182,156
	2008 \$202,156
	2009 \$169,882

A knowledge-based approach to multi-document text summarization for automated meta-analysis of the scientific literature

Funding source:	Australian Research Council (ARC) Discovery Grant DP0666600
Investigators:	Professor E Coiera, Professor J Westbrook
Funds:	2006 \$118,000
	2007 \$108,000
	2008 \$110,000

Engineering safe decision support systems for healthcare

Funding source:	Australian Research Council (ARC) Discovery Grant DP0772487
Investigator:	Dr F Magrabi
Funds:	2007 \$74,887
	2008 \$82,521
	2009 \$85,781

Informatics approaches to improving risk assessment and responses to outbreaks of communicable diseases

Funding sources: Australian Research Council (ARC) Linkage Grant LP0667531, NSW Health, Commonwealth Department of Health and Ageing

Investigators: Dr V Sintchenko, Professor E Coiera, Professor G L Gilbert

Funds:

2006	\$154,000
2007	\$142,000
2008	\$57,000

Translating bacterial molecular epidemiology into information assessment

Funding Source: NHMRC Project Grant 35851

Investigators: Professor L Gilbert, Professor E Coiera, Dr V Sintchenko

Funds:

2005	\$35,000
2006	\$25,000
2007	\$25,000

HCF Foundation PhD scholarships in health systems improvement through “in silico” simulation experiments

Funding source: HCF Health and Medical Research Foundation

Investigator: Dr G McDonnell

Funds:

2006	\$50,001
2007	\$66,666
2008	\$66,666

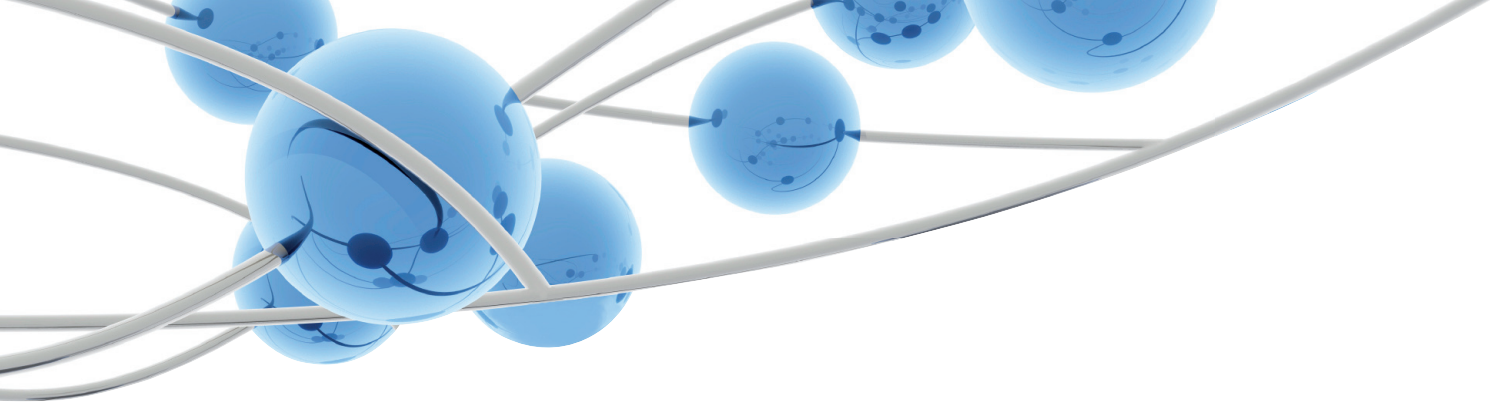
Medical Faculty Postdoctoral Research Fellowship

Funding source: UNSW Faculty of Medicine

Investigator: Dr F Magrabi

Funds:

2006	\$92,750
2007	\$92,750



An Independent National Clinical Evidence Service

Funding source:	HCF Health and Medical Research Foundation	
Investigator:	Professor Enrico Coiera	
Funds:	2008	\$509,197
	2009	\$479,658

Accelerating our understanding of the causal pathways to Cerebral Palsy with a computer supported discovery system

Funding source:	Cerebral Palsy Institute	
Investigator:	Dr Grace Chung	
Funds:	2008	\$40,000
	2009	\$40,000

Faculty Research Grant

A study of the reporting of adverse events in randomized controlled trials.

Funding Source:	Faculty of Medicine	
Investigator:	Dr Grace Chung	
Funds:	2008	\$30,000

Consistency of ovarian cancer clinical database

Funding source:	National Breast Cancer Centre	
Investigator:	Dr Farah Magrabi	
Funds:	2007	\$11,500

publications

book chapters

Lyell D, Sadsad R, Georgiou A (2007) Health Systems Simulation, *Encyclopedia of Healthcare Information Systems 2007*, Idea Group.

Sintchenko V, Coiera E (2007) Decision support in clinical bioinformatics, *Methods in Clinical Bioinformatics*, Molecular Medicine Series, Humana Press, 2007.

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BriconSouf N, Newman C (2007) Context awareness in health care: a review, *International Journal of Medical Informatics*, vol 76, Issue 1, pages 2-12.

Coiera E, Hovenga E (2007) Building a sustainable health system, *IMIA Yearbook of Medical Informatics 2007, Methods of Information in Medicine 2007*, 46 (Supp1) 26-33.

Coiera E (2007) Putting the technical back into socio-technical systems research, *International Journal of Medical Informatics*, 2007, 76(S1); 98-103.

Coiera E (2007) Lessons from the NHS National Programme for IT, *MJA vol 186 number 1*, 1 January 2007.

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Magrabi F (2007) Integrating telemedicine: review of introduction to telemedicine, *Medical Journal of Australia 186(2)*: 95 (review).

Sintchenko V, Gilbert G (2007) Utility of genotyping of Mycobacterium tuberculosis in the contact investigation: A decision analysis, *Tuberculosis 2007*; 87:176-184.

Sintchenko V, Magrabi F, Tipper S (2007) Are we measuring the right end-points? Variables that affect the impact of computerized decision support on patient outcomes: a systematic review, *Medical Informatics and The Internet in Medicine 2007*.

Westbrook J, Coiera E, Gosling A, Braithwaite J (2007) Critical incidents and journey mapping as techniques to evaluate the impact of online evidence retrieval systems on health care delivery and patient outcomes. *Int J Med Inform.* 76(2-3); 234-245.

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conference papers

Azambuja G, Zrimec T, Hopkins A (2007) A framework to extract, interpret and structure clinical information from free-texts, *12 World Congress on Health Informatics (MEDINFO 2007), Brisbane, August 2007 (Abstract).*

Busayarat S, Zrimec T (2007) Bronchopulmonary segments approximation using anatomical atlas, *Medical Imaging 2007: Image Processing, Conf. proc. vol: 6512, March 2007.*

Busayarat S, Zrimec T (2007) Lung surface classification on high-resolution CT using machine learning, *11th Mediterranean Conference on Medical and Biological Engineering and Computing - MEDICON 2007, Ljubljana, Slovenia, June 2007.*

Busayarat S, Zrimec T (2007) Detection of bronchopulmonary segments on high-resolution CT - preliminary results, *20th IEEE International Symposium on Computer-based Medical Systems, CBMS 2007, Maribor, Slovenia, June 2007.*

Chung G, Coiera E (2007) A study of structured clinical abstracts and the semantic classification of sentences, *BioNLP 2007, Prague, Czech Republic, June 2007.*

Coiera E (2007) Medical decision making in the wild, *ARCBS Transfusion Update 2007, Adelaide, May 2007.*

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