

## EDITORIAL



Michael Tyler

## ASSTA NEWSLETTER

**W**elcome to the November 2005 issue of the ASSTA Newsletter.

This is my first issue back at the helm after spending some time researching in France and The Netherlands. Thanks to David Grayden for juggling executive and editorial responsibilities while I was away!

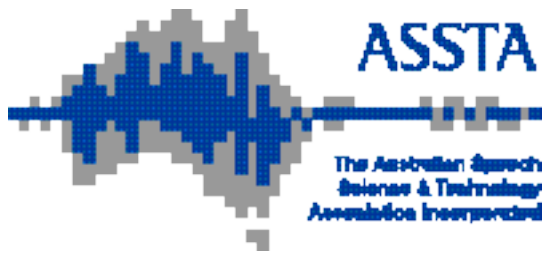
Thanks also to those members who sent me submissions for this issue. For the next issue I would like to hear from PhD students (and researchers) who attended the HCSNet summer school. Did you find it rewarding, and would you recommend it to other students? I am especially interested in hearing from all ASSTA members about what sorts of research you are engaged in. This would normally in the form of a lab profile, but if you are working individually and would like to let the wider ASSTA community know about your work, drop me a line.

This newsletter has still been designed for publication on the web. Please see the ASSTA homepage for the electronic version. All underlined words are hyperlinks to other pages, email addresses and web pages.

**Michael Tyler**

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# ASSTA INFORMATION

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Australian Speech Science and Technology Association Inc.  
GPO Box 143, Canberra City ACT 2601

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## ASSTA Newsletter Team

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## Contributions

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Copy should be sent to the editor via email as plain text or as an attachment in Rich Text Format (RTF) or Microsoft Word (DOC).

Send notices on conferences to Lisa Stephenson, and thesis abstracts and book reviews to Johanna Barry.

**Contributors:** Kirsty McDougall, Prithviraj Pradeep, Lisa Stephenson, Vanessa Surowiecki, and Kimiko Tsukada.

ASSTA recognises the support of  
The University of Western Sydney  
in the production and printing of this  
newsletter.

## ASSTA Corporate Members

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Appen Pty Ltd ([www.appen.com.au](http://www.appen.com.au))

Cochlear Ltd ([www.cochlear.com.au](http://www.cochlear.com.au))

CRC for Cochlear Implant and Hearing Aid  
Innovation ([www.bionicear.org/crc](http://www.bionicear.org/crc))

Spectral Dynamics Pty Ltd ([home.iprimus.com.au/elvoice/](http://home.iprimus.com.au/elvoice/))

Visit ASSTA on the Web:

<http://www.assta.org>

## PRESIDENT'S REPORT

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**Denis Burnham**

ASSTA, along with ALTA (the Australasian Language Technology Association), and AMPS (the Australian Music and Psychology Society), are the main three scholarly and industry organisations involved in the new ARC Research Network, Human Communication Science Network (HCSNet). Following the launch of HCSNet on Jan 27 this year, and various workshops throughout the year, the inaugural HCSNet Summerfest will be held December 13 - 16. The HCSNet Summerfest incorporates the:

- HCSNet Summer School (Tuesday 13th December to Wednesday 14th December), and;
- HCSNet Conference (Wednesday 14th December to Friday 16th December).

The HCSNet Summer School is more student-centred (although faculty and industry people are encouraged to attend), and involves

- 16 three-hour courses covering a wide range of topics in the interdisciplinary space covered by HCSNet, all taught by experts in their fields (some of these from ASSTA, of course). Topics include Auditory Perception, Formal Syntax and Morphology, Corpus Processing,

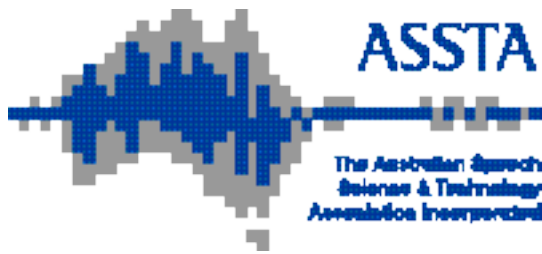
Current Approaches to Linguistics, Speech Processing, Psycholinguistics, Formal Semantics, Statistical Natural Language Processing, Face-to-Face Pragmatics, Language Acquisition (both Psycholinguistic and Linguistic perspectives), Phonetics and Phonology, Enterprise Search and Metadata, the Acoustics of Musical Instruments, and Signed Languages

- a student poster session over beer and pizza to assist the future HCSers and Speech Scientists and Technologists to get to know each other.

The HCSNet Conference is open to all and incorporates:

- the conference opening and the student poster session over beer and pizza on the evening of Tuesday 13th December;
- plenary presentations by: 1) Professor Elim Papadakis, Executive Director for Social, Behavioural and Economic Sciences at the Australian Research Council; 2) Professor Justine Cassell, an internationally recognised expert credited with developing the Embodied Conversational Agent; and 3) Stelarc, the Australian-based performance artist whose work explores and extends the concept of the body and its relationship with technology through human/machine interfaces.
- a novel 'speed papers' session on Wednesday 14th December, where interdisciplinary interaction will be promoted through short presentations

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# PERSPECTIVES ON PLASTICITY

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**Vanessa Surowiecki**  
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ISCA's workshop, PSP2005, was held June 15th to 17th at Senate House, University of London. The broad topic of PSP2005 was plasticity associated with speech perception. PSP2005 drew over 160 attendees with diverse research interests including auditory neuroscience, language acquisition and speech perception, each investigated at different stages of development and/or in clinical groups.

A goal of the workshop was to provide attendees with the opportunity to learn directly from leading researchers. PSP2005 certainly met this goal, with 17 invited presentations from leaders in their respective fields. The presented topics ranged from the physiology associated with speech perception to speech perception changes in different clinical and non-clinical groups. As a young research scientist, it was exciting to learn directly from researchers whose work and ideas have influenced my thinking including, among others, Michael Dorman, Patricia Kuhl, Anne Cutler, Sophie Scott, Paul Iverson, David Moore, Stuart Rosen and Johanna Barry.

The workshop structure provided an even balance between the invited speaker presentations and poster sessions. Attendees had the opportunity to engage in meaningful discussion and debate with the 87 leading and upcoming researchers who presented posters. A wide range of research was

displayed in the posters, including research of a theoretical basis to research with applications to specific clinical groups. As one of the poster presenters, I was grateful for the opportunity to present my research to, and receive feedback from, researchers with diverse perspectives and interests. Many posters presented research that has direct implications and applications to my research interests. I was appreciative of the opportunity to learn more about the research and to discuss potential collaborations and information-sharing with the presenters.

By attending the PSP2005 seminars and poster sessions, participants obtained a broad overview of numerous related research fields and were provided with information that enabled them to consider their own research from the different theoretical and practical perspectives presented. This was a great strength of PSP2005 and the workshop organisers, Valerie Hazan and Paul Iverson, are to be commended.

Another goal of workshops is to strengthen existing research partnerships and to foster the development of new collaborations. The structure of PSP2005 provided participants ample time to interact between sessions and at the social function held on the 15th. I was grateful for the opportunity to speak with Kathleen Pichora-Fuller and Ruth Campbell as their publications were valuable in the formation of my Ph.D. I made the most of the available time to discuss research in greater depth with presenters and to learn of the research environment in different academic and clinical settings.

In addition to the considerable knowledge and networking opportunities provided at PSP2005, attendees also received

membership to ISCA and a CD containing the workshop proceedings.

I benefited considerably by attending PSP2005 and I am grateful to ASSTA for the financial support they provided. Funding provided by ISCA also supported my attendance at PSP2005. I came away from the workshop with many new perspectives on speech perception, with greater awareness of the interrelationships between my research and that of parallel research communities and with numerous ideas for future projects. I look forward to integrating my PSP2005 experiences into my research and fostering the research networks I established at the workshop.

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### Kimiko Tsukada

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I recently attended the ISCA (International Speech Communication Association) Workshop on Plasticity in Speech Perception (<http://www.psp2005.org.uk/>) held at the Department of Phonetics and Linguistics, University College London from June 15 to 17. The aim of this workshop was to bring together researchers who examine changes in speech perception during infancy and adulthood, from clinical and non-clinical perspectives and researchers who study plasticity in other domains for the exchange of ideas. I was fortunate to receive an ASSTA Travel Award to attend this very intense but

interesting workshop.

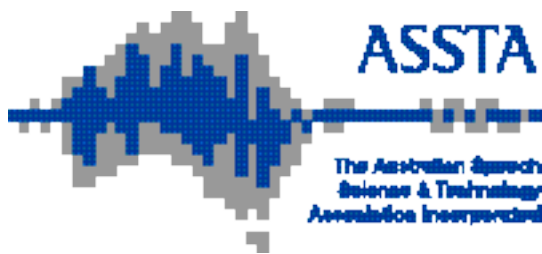
A total of 104 papers (17 talks and 87 posters) were presented over three days, covering a wide range of topics such as first/second language acquisition, infant perception, hearing impairment, auditory rehabilitation and auditory neuroscience. A presentation by Professor Patricia Kuhl on the first day of the workshop was conducted over the phone across the Atlantic Ocean. The organizing team must have been extremely organized to make this happen.

I presented a poster entitled "Cross-linguistic speech perception of final stops by Australian-English, Japanese and Thai listeners". I was pleased to get many people viewing and commenting on my poster, but this meant that I was unable to view as many posters as I would have liked.

Authors were given the option of submitting either a four-page proceedings paper or a one-page version of their poster to be included in the CD-ROM proceedings. In addition to the workshop participants, the ISCA members are given access to the proceedings via the ISCA electronic archive. This will be useful to make participants' work available to the wider community of speech researchers. For other researchers who are interested, copies of the CD proceedings are on sale for 10 pounds (see the website above).

For me personally, it was good to see researchers from overseas with whom I have worked and will continue to work.

The venue was conveniently located in central London and within a short walking distance to the British Museum. One of the current exhibitions "Mummy: the inside story" was very nice.



## CONFERENCE LOG

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Please inform Lisa Stephenson ([lisa@maccs.mq.edu.au](mailto:lisa@maccs.mq.edu.au))  
about conferences of interest for inclusion in this section.

14-17 Nov 2005

International Conference on Critical  
Discourse Analysis: Theory into Research  
University of Tasmania, Australia  
<http://www.educ.utas.edu.au/conference/>

18 - 19 November 2005

Toronto Workshop on Phonetics, Gender  
and Sexual Orientation  
Toronto, Canada  
[http://www.chass.utoronto.ca/  
sociophonetics05/](http://www.chass.utoronto.ca/sociophonetics05/)

20-24 Nov 2005

Sonic Interfaces and Sonification:  
Functions, Methods, Futures  
Canberra, Australia  
<http://www.ozchi.org/index.php?id=tut11>

5 Dec 2005

Australasian Ontology Workshop  
Sydney, Australia  
<http://www.cse.unsw.edu.au/~aow05/>

10 December 2005

Seoul Workshop on Phonological Typology  
Seoul, Korea  
[jongho@snu.ac.kr](mailto:jongho@snu.ac.kr)

15 - 17 December 2005

ConSOLE XIV: 14th Annual Conference of  
the Student Organization of Linguistics in  
Europe  
EHU-UPV (University of the Basque  
Country), Basque Country, Spain  
<http://www.ehu.es/console>

17-19 Jan 2006

3rd Old World Conference in Phonology  
(OCP3).  
Budapest, Hungary  
<http://nytud.hu/ocp3>

21 January 2006

Recherches Actuelles en Phonétique et  
Phonologie  
Paris, France  
[http://www.atala.org/article.php3?id\\_  
article=278](http://www.atala.org/article.php3?id_article=278)

9-11 April 2006

Multilingual Speech and Language  
Processing (Multiling 2006) ISCA Tutorial  
and Research Workshop (ITRW)  
Stellenbosch University, South Africa  
<http://www.unistel.co.za/multiling2006>

10-12 April 2006

28th European Conference on Information  
Retrieval (ECIR 2006)  
Imperial College London, UK  
<http://ecir2006.soi.city.ac.uk/>

10-12 April 2006

Meeting of the British Association of  
Academic Phoneticians (BAAP 2006)  
Edinburgh, UK  
<http://www.qmuc.ac.uk/ssrc>

20-22 April 2006

1st Slovene International Phonetic  
Conference (SloFon 1)  
Ljubljana, Slovenia  
<http://slofon.zrc-sazu.si>

2-5 May 2006  
Speech Prosody 2006 International  
Congress Center,  
Dresden, Germany  
<http://www.ias.et.tu-dresden.de/sp2006/>

3-5 May 2006  
Computers & Philosophy (i-C&P 2006)  
Laval, France  
[http://ateliers.iut-laval.univ-lemans.fr/i-CaP\\_2006/](http://ateliers.iut-laval.univ-lemans.fr/i-CaP_2006/)

10-14 May 2006  
International Conference on Conversation  
Analysis (ICCA)  
University of Helsinki, Finland  
<http://www.helsinki.fi/hum/skl/icca/>

May 11-13 2006  
Natural language and knowledge  
representation (NL-KR)  
Florida, United States  
<http://www.indiana.edu/~flairs06>

21-25 May 2006  
Speech Pathology Australia National  
Conference: Frontiers  
Fremantle, Western Australia  
<http://www.speechpathologyaustralia.org.au/Content.aspx?p=62>

22-26 May 2006  
Fifteenth International World Wide Web  
Conference (WWW2006)  
Edinburgh, UK  
<http://www2006.org/>

31 May - 3 June 2006  
11th Symposium International Clinical  
Phonetics and Linguistics Association  
(ICPLA11)

Dubrovnik, Croatia  
<http://icpla.ffzg.hr/>

7 - 10 June 2006.  
5th International Conference on Speech  
Motor Control  
Nijmegen, Netherlands  
<http://www.slp-nijmegen.nl/smc2006/>

19 - 23 June 2006  
International Conference on Infant Studies  
Kyoto, Japan  
[http://www-psych.stanford.edu/~carl/isis06/Kyoto\\_1.htm](http://www-psych.stanford.edu/~carl/isis06/Kyoto_1.htm)

29 June - 1 July 2006  
10th Conference on Laboratory Phonology  
(LabPhon10)  
Paris, France  
<http://www.lpl.univ-aix.fr/~labphon/>

7 - 9 September 2006  
2nd TIE Conference on the Typology of  
Tone and Intonation  
Berlin, Germany  
[http://www.zas.gwz-berlin.de/index.html?events\\_tie2](http://www.zas.gwz-berlin.de/index.html?events_tie2)

8 - 10 September 2006  
Conference on Laboratory Approaches to  
Spanish Phonology  
Toronto, Canada  
[http://www.chass.utoronto.ca/spanish\\_portuguese/phonology/](http://www.chass.utoronto.ca/spanish_portuguese/phonology/)

17 - 22 September 2006  
Interspeech'2006 - ICSLP (International  
Conference on Spoken Language  
Processing)  
Pittsburgh, Pennsylvania, USA  
<http://www.interspeech2006.org/>

## THESIS ABSTRACTS

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### The Role of Formant Dynamics in Determining Speaker Identity

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This dissertation examines formant frequency dynamics as a source of information for characterising individual speakers. Formant frequencies convey differences between speakers as these features are determined by the physical dimensions of a speaker's vocal tract in combination with the way the speaker configures his or her articulators to produce each speech sound. Measurements of formant frequencies taken at the time-slice at which the target for a sound is achieved have been demonstrated to vary between speakers, but the use of formant dynamics for speaker characterisation has not been investigated in detail. This dissertation reports a series of experiments investigating the speaker-specificity of dynamic information conveyed by the first three formant frequencies produced by groups of male speakers.

Chapter 1 provides an introduction to the problem of speaker definition and background regarding the potential contribution of formant frequencies to speaker characteristics. Chapter 2 presents a study of the formant dynamics of the rhyme /aɪk/ in Australian English. Greater differences between speakers were found when dynamic information was included in the analysis as compared with measurements at a single time-slice. Speakers' formant contours varied in both shape and relative frequency, and these differences were preserved across different rate and stress conditions. In Chapter 3 the investigation of the effect of different levels of stress

on the speaker-specificity of formant frequencies is extended to the unstressed vowel schwa. The chapter describes a range of inter-speaker variation in vowel-to-vowel coarticulation of schwa in Standard Southern British English, and also contributes to the debate regarding the acoustic and articulatory definition of schwa. In Chapter 4 the idea that variation between speakers in vowel-to-vowel coarticulation might extend across an intervening schwa is tested. Some individual differences were observed, but overall coarticulation of non-adjacent syllables was rarely present. Chapter 5 returns to the investigation of speaker-distinguishing aspects of formant contours, this time examining /r/, a segment known to be produced with varying articulatory strategies for different speakers. Formant dynamics of intervocalic /r/ sequences for a group of Standard Southern British English speakers exhibited striking between-speaker variation in terms of contour shape, relative frequency and timing. Chapter 6 explains the need for a technique to capture dynamic information in formant frequencies with an elegant descriptor for individual speakers, and presents preliminary results from an attempt to do this using linear regression for the /aɪk/ and intervocalic /r/ data.

In the final chapter, it is concluded that formant frequency dynamics are a significant source of information about the identity of a speaker. While between-speaker differences in coarticulation of formant frequencies were not sufficiently marked to discriminate each individual, data from formant frequency contours yielded clear speaker-specificity. The significance of the findings for speaker characterisation is outlined, and the implications of this work for forensic speaker identification discussed.

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## An Electropalatographic and Acoustic Analysis of Frequency Effects in the Lexicon

Lisa Stephenson  
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Three studies investigated the influence of psycholinguistic factors, such as phonotactics, lexical frequency and phonological neighbourhood size, on speech production.

The first study used electropalatography (EPG) to compare the articulation of consonant clusters in English and Japanese, which differ in the phonotactic constraints regarding legal consonant clusters. This study has found that the structure of the lexicon influenced speech articulation, for it was English speakers who preserved the influence of alveolar gestures in assimilated productions, whereas the produced blends of the Japanese speakers showed little or no influence of an alveolar in the auditory input.

The second study investigated consonant

cluster articulation, using EPG, in high and low frequency compound words. The study found that high frequency words were produced with more complete assimilation than low frequency compound words.

The third study used acoustic analysis to investigate how lexical frequency and phonological neighbourhood density influenced vowel production. The experiment found that vowels in low frequency words, from dense phonological neighbourhoods, were produced with a more expanded F1/F2 vowel space than high frequency words, from sparse phonological neighbourhoods. Additionally, this experiment looked at vowel production in nonwords from sparse and dense phonological neighbourhoods. Nonwords from sparse phonological neighbourhoods were produced with a more expanded vowel space than those in dense neighbourhoods.

These results suggest that higher level cognitive processing does influence the phonetic realisation of words and nonwords. These findings are related to phonetic and cognitive models of speech production.

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## THE 5TH COLUMN

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The 5th Column is about your views on ASSTA. It is a vehicle for voicing independent views within our association. It is a way to let both the executive and the general membership know your feelings about the issues. It is particularly important in light of ASSTA's positive financial position. It was created to promote a transparent exchange

of ideas; responses to 5th Column articles will also be published in this column.

You might have noticed that few members have taken up the opportunity to use this outlet. Go on, be controversial! Send your submission to the editor, Michael Tyler, with a short bio and help save the 5th Column!



## ASSTA MEMBERS IN THE PRESS

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### ASSTA Forensics Subcommittee Press Release About "Aussie- sounding" Terrorist

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A number of Forensics Subcommittee members were called upon for media interviews after the release of the following:

#### CAUTION REQUIRED IN DRAWING CONCLUSIONS FROM ACCENTS

A person's voice can give a great deal of information about that person's background. As human beings we use such information every day to make informal judgments about the people we interact with.

But it is necessary to question the reliability of such judgments when they are made in a context where it really matters.

Certainly voices can be analysed for useful evidence about their speakers' background. However special expertise is needed to do such analysis and evaluate the evidence. We all speak the language but only highly trained experts are in a position to back up their judgments with evidence and contextualise it appropriately. A strong background in phonetics is needed to provide detailed auditory and acoustic features of the voice, and great care is needed in evaluating the significance of those features.

Currently media interest has been raised concerning a recording of a masked man making terrorist threats - specifically, as to whether his accent is Australian. Two issues need to be distinguished. The first is the identification of phonetic features of the man's voice. The second is the extent to

which reliable inferences can be made from the accent to the social background of the speaker. Results of a full phonetic analysis provide evidence which must be evaluated, along with other non-voice evidence, using appropriate statistics.

No one has yet done a full phonetic analysis of the voice, but several phoneticians around the country have listened to the recording and agree that the voice has many features suggesting the man has spent a considerable proportion of his early life with Australians.

This is far from saying that he is Australian by nationality - nationality cannot be inferred from accent. The same issue was raised last year in reports and guidelines about the use of language analysis to determine nationality in asylum seeker cases. (See references below.)

Some phoneticians also agree that the voice has features consistent with many Australian speakers of middle Eastern heritage. This remains a tentative conclusion pending more detailed analysis. Even if it is supported by more detailed analysis, it is far from being a definitive statement about the man's heritage, his religion, where he was born, when or where he learned Australian English, or about what other languages he may or may not speak.

It is clear that, when the stakes are high, the need for caution is as great with language analysis as with any other science. It is unfortunate that the 'language science' of linguistics, and its many diverse branches, remain little known in our community and that expertise is often sought or claimed from inappropriate sources.

## Appen Wins NSW Premier's ICT Exporter of the Year Award

Congratulations to ASSTA corporate member, Appen Pty Ltd, which has won the Information and Communications Technology Exporter of the Year award in the 2005 Premier's NSW Export Awards!

Appen processes linguistic data in more than 50 languages and its products can be found in telephone call centres, command and control applications such as are used in mobile phones and in-car navigation systems, and in government homeland security and defence applications.

In the last six years, Appen has provided speech and language technology to a global market that includes customers such as IBM, Microsoft, Sony, Siemens, Nuance/ScanSoft, Telstra and a number of Australian and US government and defence organisations.

The secret of Appen's success will come as no surprise to ASSTA members – according to Appen's joint managing director, Chris Vonwiller, it is due to multidisciplinary collaboration between computer scientists and linguists.

If you would like to contact Appen, call Phil Hall on 0407 468 273 or 02 9468 6300.

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Continued from page 3

by HCSNetters on the range of research that makes up human communication science;

- the Fifteenth Australian Language and Speech Conference, including plenaries by Professor Catherine Best, Chair in Psycholinguistic Research at UWS, and

Professor Brian Byrne, from the School of Psychology at the University of New England

- WISP: the Workshop on Interactive Systems in the Performing Arts;
- SPRAPAC: the Workshop on Speech Processing and Auditory Perception under Adverse Conditions.

I commend to you all of the above. The speed paper session on December 14 will involve 4-min papers by academics and industry people on all manner of things - projects (current, future, fantastic dreams of what could be), knotty problems, an overview of a person's research area etc. These are designed to improve our understanding of related disciplines, and facilitate collaboration – there will be a session the following day to follow up on particular presentations that people wanted to pursue.

Registration is free for all students, and travel is free to students within Australia. Registration is \$150 for faculty and industry people, unless they are presenting a paper in one of the events, in which case it is \$50. Any of these registration options allow attendance at all activities at the Summerfest. Registration due date is November 11. Further details about the Summerfest can be found at

<http://www.hcsnet.edu.au/summerfest>  
and registration can be effected at the bottom of the page:

<http://www.hcsnet.edu.au/summerfest/registration-options>

I hope to see you there.

Denis Burnham



## ASSTA GRANTS PROGRAM AWARDEES

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### ASSTA PhD of the Year 2004

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Dr Roland Goecke, NICTA, ANU

### ASSTA PhD Study Awards

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Mr Brendan Dean, QUT, Supervisor Sridha Sridharan

Mr Patrick Lucey, QUT, Supervisor Sridha Sridharan

Mr Oscar Chan, UWA, Supervisor Roberto Togneri

Mr Aik Ming Toh, UWA, Supervisor Roberto Togneri

<http://www.assta.org/initiatives/>

## **SST CONFERENCE PROCEEDINGS**

Past SST and ICSLP'98 conference proceedings are available for purchase.

SST-86 to SST-2002 proceedings: \$5.50

ICSLP'98 proceedings (on CD): \$27.50

SST-2004 proceedings are available on the web

(<http://www.assta.org/sst/2004/>)

Non-members add \$11, institutions add \$55 to prices for SST proceedings.

Postage and packaging is extra. All prices include GST.

Contact the Publications Manager: [dgrayden@bionicear.org](mailto:dgrayden@bionicear.org)