

## EDITORIAL



David Grayden

ASSTA NEWSLETTER

**W**elcome to the December 2004 issue of the ASSTA Newsletter. The release of this issue has been timed to coincide with SST-2004, the Tenth Australian International Conference on Speech Science & Technology.

Since the last issue, four people were awarded ASSTA conference travel funds to attend INTERSPEECH, ICSLP-2004. So this issue has a conference report from each of them. It is interesting to see how people view conferences in different ways, especially when comparing those who do research in speech science and in speech technology. We also have another PhD Thesis abstract from Dr Shunichi Ishihara, the treasurer of ASSTA, entitled "An Acoustic-Phonetic Descriptive Analysis of Kagoshima Japanese Tonal Phenomena".

Remember, this newsletter is a forum for you to share information about your travels, research and labs. Please consider submitting something for the next issue. Keep an eye out for a reminder in an ASSTA electronic bulletin.

This newsletter has 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.

**David Grayden**

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ASSTA

The Australian Speech  
Science & Technology  
Association Incorporated

## ASSTA INFORMATION

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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:** Johanna Barry, Denis Burnham, Roland Goecke, Shunichi Ishihara, Lisa Stephenson, Dat Tran, Kimiko Tsukada.

ASSTA recognises the support of  
*The Bionic Ear Institute*  
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### ASSTA Corporate Members

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## PRESIDENT'S REPORT

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**Denis Burnham**

### **Speech and Language**

**A** feature of Interspeech 2004, the International Conference on Spoken Language Processing held on Jeju Island, Korea, October 4 to 8, 2004, was the highlighting of the Korean alphabet, Hangeul - in the Opening Address, in a Keynote Address, in displays, and a number of papers. Koreans are justly proud of their alphabet.

Why is this written language form of interest in the President's Report for the Australian *Speech Science and Technology Association*? Because, of all the world's writing systems, Hangeul is probably the one that is closest to representing speech in symbolic form. Unlike Chinese, in which the characters have their origins as pictorial referents to world objects, the shape of Hangeul letters refer to the shape of the mouth in making those letters. For example, [s], ㅅ, represents the shape of the tongue almost touching the alveolar ridge and allowing air to pass between, [n], ㄴ, the shape of the tongue curving up to touch the teeth/ alveolar ridge, and [m], ㅁ, the shape of the closed mouth. The voiced stop

consonants, [b], [d], and [g], represented as ㅂ (note similarity to [m] - plus release), ㄸ, and ㄱ, all also correlate with the dynamics of the articulatory apparatus. The voiceless equivalents, [p<sup>h</sup>], [t<sup>h</sup>], and [k<sup>h</sup>] are formed by adding a stroke to represent the aspiration, viz, ㅍ, ㅌ, and ㅋ. A stroke of genius.

Whose genius? King Sejong the Great (1418-1450), who commissioned scholars to work in the Jiphyonjeon, an academic research institute within the palace walls. With these scholars, King Sejong invented a rain gauge, a water clock, a sundial, a fairer system of justice, and what was then called Hunmin Jeongeum - 'the correct sounds for the instruction of the people' - and later called Hangeul. Work began on the alphabet in 1443, and it was proclaimed in 1446, much to the disgust of some scholars more used to the lengthy instruction and practice required to read Chinese. Some such scholars labelled it "vulgar script", or "women's letters", for it was thought to be so easy that even women could read it! Now it is said in Korea that it takes a bright child a morning to learn Hangeul, and a dull child, a day...

Despite opposition, Hangeul survived and is now the main script in South Korea, and the only script in North Korea, representing the 14 consonants and 10 vowels in Korean with ease. Indeed with such ease that in his Keynote Address at Interspeech 2004, Professor Hyun-Bok Lee of Seoul National University, set out his International Korean Phonetic Alphabet (IKPA), an expanded Hangeul, which is

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Continued from page 3

designed to capture the sounds of the world's languages in a much more intuitive, organic, and articulatory valid form than the current International Phonetic Alphabet (IPA). (It might be noted, however, that the IKPA does not include a representation of tones.)

It may be difficult to persuade the world's phoneticians to adopt IKPA at this stage (not that it isn't worth trying), but what Hangeul and the IKPA bring to our attention is the dependence of writing on speech, and the close interrelationship between the two. Indeed, Hangeul is spoken of as "visible speech", a term which sits nicely with the recent emphasis on the auditory-visual nature of speech perception and production.

The relationship between spoken and written language is worth considering as we approach the Australian International Conference on Speech Science and Technology, SST-2004, at Macquarie University. Prior to this, the Australian Language Technology Association (ALTA) will host a summer school program (including speech and language courses). Maybe this juxtaposition of language and speech will seed the development of a new script, a new agenda, one that could also have input from the recently funded ARC Network on Human Communication, concerned with speech, text, and sonics (environmental sound, and music).

### **Johanna Barry**

Dr Johanna Barry has served on the ASSTA Executive for the last 3 years and for the last 2 years as ASSTA Secretary. A year ago she moved to the UK to take up a Postdoctoral Fellowship at Oxford, but continued on as ASSTA Secretary despite the early mornings and late evenings required for her to attend the ASSTA Executive Teleconference Meetings. However, the tyranny of distance has prevailed and she is now stepping down from the ASSTA Executive. I wish to thank Johanna personally, and on behalf of the ASSTA Executive and Membership, for her efficient, resourceful, and cheery work on the Executive and as Secretary. Thank you, Johanna, and best wishes.

### **STOP PRESS: ARC Research Network on Human Communication**

Even as contracts with the 15 contributory organisations (including ASSTA) are being signed, preliminary work on new ARC Research Network originally called 'Enabling Human Communication' has begun. Now called the *Human Communication Science Network (HCSNet)*, the inaugural Steering Committee meeting will be held early December, and it is envisaged that the first meeting of the membership will be held early 2005.

# PRIX BENOÎT REPORT

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*Summary report on the multimedia project developed with funds provided by the Prix Benoît*

Johanna Barry, Department of Experimental Psychology, University of Oxford  
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Approximately two years ago, I was awarded a Prix Benoît. This award was created in 26 April 1999 in honour of Christian Benoît who died in 1998. The aim of the prize is to promote a young researcher by funding a multimedia project based on his/her doctoral research. For my project, I proposed developing a take-home tone habilitation tool. This tool would provide audio-visual feedback to help hearing-impaired Cantonese speakers improve their tone production. The prototype tool has now been completed. A picture of one of the screens is shown below. The program has the following features:

- (1) A series of 12 exercises that increase in difficulty as more tones are contrasted,
- (2) A picture and a Chinese character indicating the word to be produced,
- (3) A model pronunciation of the tone to be produced,
- (4) A record facility for the user to record their production of a tone into the program for analysis,
- (5) A playback button which allows the user to hear what they have produced,
- (6) A display graph of pitch contour produced by the user. This allows him/her to visually compare it with the model speaker's pitch contour,
- (7) An automatic extraction routine which extracts the onset and offset pitch values of each tone,

- (8) A graphing facility. This plots pitch offset versus pitch onset so that the speaker can see how differentiated the different tones are that he/she has produced as part of the exercise,
- (9) A numerical readout summarising how differentiated the tones are overall,
- (10) A facility to save the results from one session to the next.

The program is aimed at Cantonese-speaking users and it is has for the most part been produced in Chinese. It has been designed to be downloadable from the Web. The web address is: [http://www.psych.ox.ac.uk/oscci/johanna\\_barry/v2/index.htm](http://www.psych.ox.ac.uk/oscci/johanna_barry/v2/index.htm)

To make it more accessible to interested people from other linguistic backgrounds, a series of bilingual web-pages in English and Cantonese have also been produced which describe how ToneDoctor functions. Some of the research underpinning its development can be read in:

Barry, J. G., and Blamey, P. J. 2004. The acoustic analysis of tone differentiation as a means for assessing tone production in speakers of Cantonese. *Journal of the Acoustical Society of America* 116:1739-1748.

Overall, I believe the concept has value not only for tone habilitation but also to help students of Cantonese develop their tone production. I also believe that the concept could be extended for use with speakers of other languages. I and my collaborators would very much like to turn this into fully functioning product and we would really value any feedback on how to improve it.

## 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.

### 2004

8 - 10 December  
SST2004 (incorporating ALTW)  
ALTA Summer School (4-7 December)  
Macquarie University, Sydney  
<http://www.assta.org/sst/2004/>

14 - 17 December  
ISSNIP 2004 Workshop on Biologically  
Inspired Models  
Melbourne, Australia  
[http://www.issnip.org/  
wkshbioinsmodels.htm](http://www.issnip.org/wkshbioinsmodels.htm)

16 - 18 December 2004  
4th International Symposium on Chinese  
Spoken Language Processing (ISCSLP'04),  
Hong Kong, China  
<http://www.iscslp2004.com/>

### 2005

20 - 22 January 2005  
2nd Old World Conference in Phonology  
(OCP2).  
Tromsø, Norway.  
<http://castl.uit.no>

23 - 25 February 2005  
Speech perception within or outside  
phonology?  
Workshop as part of the 27th annual  
meeting of the German Society for  
Linguistics (DGfS). Cologne, Germany.  
[http://www.zas.gwz-berlin.de/events/  
percphon/](http://www.zas.gwz-berlin.de/events/percphon/)

25 - 27 February 2005.

Penn Linguistics Colloquium, University of  
Pennsylvania, Philadelphia, USA.  
<http://www.ling.upenn.edu/Events/PLC>

30 March 2005  
Synchrony Meets Diachrony in Phonology.  
A pre-Glow  
phonology workshop. Geneva,  
Switzerland.  
<http://www.unige.ch/glow05>

19 - 22 April 2005  
NOLISP'05: Non-Linear Speech  
Processing,  
Barcelona, Spain  
[http://www.nolisp2005.org/  
faundez@eupmt.es](http://www.nolisp2005.org/faundez@eupmt.es)

15 - 17 June 2005  
Plasticity in Speech Perception  
(PSP2005). ISCA Tutorial and Research  
Workshop. Senate House, London, UK  
<http://www.psp2005.org.uk/>

16 - 18 June 2005  
Between Stress and Tone (BeST),  
Leiden, The Netherlands  
<http://www.ias.nl/ias/agenda/best/>

31 August - 3 September 2005  
The Sixth Pan-European Voice Conference  
(PEVoC-6): Mirroring the Voice,  
The Royal Academy of Music, London, UK  
[www.pevoc6.com](http://www.pevoc6.com)  
[info@pevoc6.com](mailto:info@pevoc6.com)

4 - 8 September 2005  
Interspeech (Eurospeech)-2005,  
Lisbon, Portugal  
<http://interspeech2005.org/>

# PHD ABSTRACT

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*An Acoustic-Phonetic Descriptive  
Analysis of Kagoshima Japanese Tonal  
Phenomena*

Shunichi Ishihara,  
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This thesis presents a linguistic-phonetic description of the acoustic properties of the contrastive accentual patterns in Kagoshima Japanese. Kagoshima Japanese is one of the traditionally so-called two pattern varieties of Japanese.

Different phonological analyses of the contrast are described in detail in order to situate the phonetic description. Data from four native speakers—two males and two females—are used, appropriately log z-score normalised to yield mean normalised F0 curves necessary for linguistic-phonetic description. Normalisation procedures are discussed, justified and explained.

The acoustic realisation of the Kagoshima Japanese contrast is specified on words from one to seven syllables in length, and a surface representation proposed within Autosegmental-Metrical theory. Some microprosodic aspects are also examined, especially in terms of the effect of the syllable-rhyme structure (i.e. vowel length, final nasal) on F0. In addition is examined what happens when accentual units are juxtaposed in three types of syntagms (noun phrase e.g. *nagaka tamago*; possessive phrase e.g. *mago no kimono*;

simple sentence, e.g. *sakana ga nigeru*).

Where appropriate, comparisons are drawn with Standard Japanese to highlight similarities and differences in tonality.

It is shown that, like Standard Japanese, the Kagoshima Japanese accentual contrast is realised as +/- falling pitch/F0, and also like SJ, the contrast is manifested globally, throughout the word. Microprosodically, it is shown that syllable-final nasals are associated with higher F0, not necessarily on the nasal itself, and that heavy syllables also evince a higher F0. Finally, two extrinsic allotones—level and falling—are demonstrated for one of the accentual types, depending on its rhyme constituents.

As far as the juxtaposed data are concerned, it is shown that, unlike Standard Japanese, no deaccentuation is involved. Moreover, a differential effect is demonstrated, in terms of F0 downstep, with respect to syntactic type: noun phrases behave differently from possessive phrases and simple sentences in showing no downstep. It is suggested that the magnitude of downstep in Kagoshima Japanese may be smaller than in Standard Japanese.

It is proposed that the linguistic-phonetic representations derived in this thesis can be used not only to investigate within-language linguistic features (e.g. the Kagoshima Japanese accentual contrast), but also to compare Kagoshima with the corresponding linguistic-phonetic representations of other Japanese varieties.

## CONFERENCE REPORT (1)

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*INTERSPEECH 2004 - ICSLP  
4-8 October 2004, Jeju Island, Korea*

Dat Tran, Human-Computer Communication Lab., University of Canberra  
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The International Conference on Spoken Language Processing (ICSLP) is one of the major international conferences on speech science and technology. It is noted that the ICSLP and Eurospeech conferences have been held as INTERSPEECH conferences since 2001. This year, the 8<sup>th</sup> ICSLP was held from 4<sup>th</sup> to 8<sup>th</sup> of October at the International Convention Center in Jeju Island, South Korea.

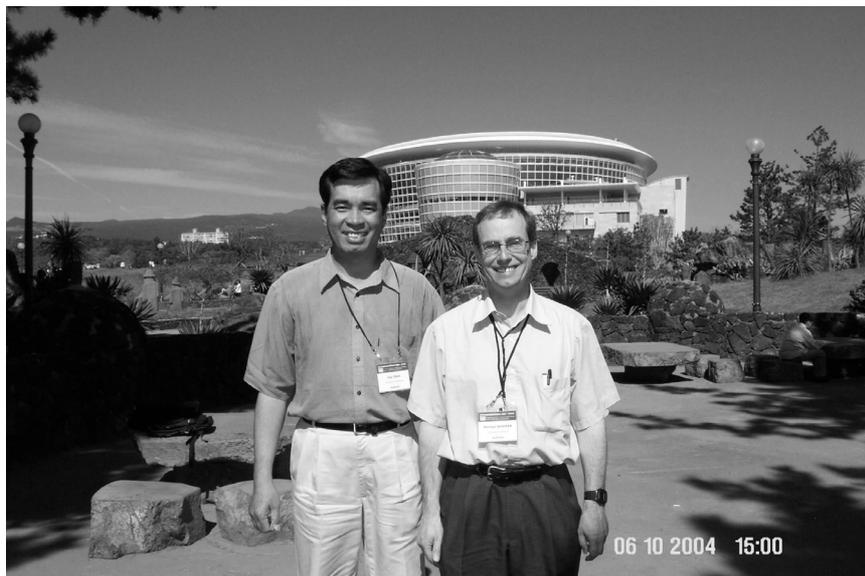
It was mentioned at the conference that South Korea is the world's most digital country. All schools and institutes have broadband access and half of all Korean homes have broadband as ADSL. Within the next three years, four out of five Korean citizens will have broadband of 20 Megabits/sec or faster. Korea is also known as "the

land of phonetics". The Korean alphabet is an "organic alphabet" - it consists of 28 simple and yet versatile letters reflecting a physiological analysis of the actions of the organs of speech.

There were about 770 papers selected for presentation from more than 1000 papers submitted to the conference and more than 900 participants from 45 countries. A plenary session, a special session, three parallel sessions of oral presentation and three parallel poster sessions were run for four full days. Particularly, there were 3 sessions for speech recognition and 4 sessions for speaker recognition.

In one plenary session, the knowledge-rich data driven modeling paradigm was introduced as a new speech research paradigm for next generation automatic speech recognition. In another, the principles and advantages of the International Korean Phonetic Alphabet were

[Continued on page 11](#)



Dat Tran (left) and Michael Wagner in front of the International Conference Centre on Jeju Island, Korea.

## CONFERENCE REPORT (2)

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*INTERSPEECH 2004 - ICSLP*  
*4-8 October 2004, Jeju Island, Korea*

Roland Goecke, National ICT Australia,  
ASST, Canberra  
[roland.goecke@nicta.com.au](mailto:roland.goecke@nicta.com.au)

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I recently attended the 2004 ICSLP conference on the island of Jeju, South Korea. My attendance was supported by a travel grant from ASSTA. The conference was held at the modern International Convention Centre in the tourist resort of Jungmun, which also featured a range of hotels, as the island is a major Korean tourist destination. A relatively large number of participants stayed in hotels further away from the convention centre than most anticipated, thus limiting the after-hours discussions as transport largely relied on shuttle buses. If anything, the issue of conference shuttle buses not running at all or not running at advertised times was one small negative aspect of an otherwise flawlessly organised conference.

Following previous ICSLP conferences, and similar to other major spoken language conferences like Eurospeech or ICASSP, this conference offered multiple oral and poster sessions simultaneously. A tutorial day on Monday offered six tutorials on topics ranging from auditory scene analysis over speech recognition to multimodal interaction. Each of the four remaining days kicked off with a plenary session, with topics on speech processing, automatic speech recognition,

a universal phonetic alphabet, and an integrated view of the speech communication process. Once again, ICSLP showed its international flavour with almost 800 participants from 35 countries. Even though the Australian contingent was relatively small in numbers (about 10), I believe its voice in spoken language research is well heard. The idea of bidding to host ICSLP in Australia again was also well received.

Personally, my focus was mostly on the special session on Auditory-Visual Speech Processing (actually three sessions), the multimodal interaction sessions, and the speech and affect sessions. It was exciting for me to see how much the interest in AV speech processing had grown and that the issue of well-designed, reusable AV speech data corpora was a highly topical one. I believe that, perhaps supported by the new ARC Research Network, Australian spoken language research could be at the forefront of this development. One of the advantages of such a large conference is that it provides an easy way to get an overview of current trends in spoken language research. From what I have seen, the new challenges in automatic speech processing are in multimodal, multi-sensor speech processing and in its application to a wide range of everyday situations. A list of sessions and papers can be found at the conference website <http://www.icslp2004.org>. The next Interspeech conference will be held in Lisbon, Portugal, 4-8 September 2005.

## CONFERENCE REPORT (3)

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*INTERSPEECH 2004 - ICSLP*  
4-8 October 2004, Jeju Island, Korea

Kimiko Tsukada, MARCS Auditory Labora-  
tories, University of Western Sydney  
[k.tsukada@uws.edu.au](mailto:k.tsukada@uws.edu.au)

The 8<sup>th</sup> International Conference on Spoken Language and Processing (ICSLP) was held in Jeju, the isle of the Gods, in Korea from October 4 to 8. I was fortunate to receive an ASSTA Travel Award to attend this conference (<http://www.icslp2004.org>).

As many ASSTA members would know (the 5<sup>th</sup> ICSLP was held in Sydney in 1998), this was a huge meeting attracting more than 900 participants (and more than 700 papers) from all over the world. It is my impression that there is probably more for speech technology people than for speech science people in this conference. However, I think the conference is sufficiently multi-disciplinary and there are always interesting papers to make you feel enriched. I presented a paper entitled "a cross-linguistic acoustic comparison of unreleased word-final stops: Korean and Thai" in a poster session (Linguistics, Phonology and Phonetics II). It was nice to get comments from Korean researchers and speakers of languages with unreleased final stops (e.g., Cantonese and Taiwanese).

Each day started with a plenary lecture. The one given by Professor Hyun-Bok Lee from Seoul National University (In search of a universal phonetic alphabet – theory and application of an organic visible speech) was most interesting to me. There was also a special exhibition about the Korean

alphabet (Hangul) with a short presentation by Professor Sang-Oak Lee (Seoul National University). It was a very nice arrangement and phoneticians would certainly be interested to learn how Hangul was created. The birthday of Hangeul was October 9, and maybe because of this, one could see many Korean national flags on the street near the Jeju airport and there was also quite a lot of media coverage on this event.

Jeju is a nice play to relax if you are on holidays and the venue (International Convention Center Jeju) was impressive with a magnificent view of the ocean and a beautiful garden behind it. During the conference, the weather was great (but a typhoon in the area before and after had some Japanese people worried about their return flights being cancelled). Although this is trivial, it was somewhat disappointing that only student participants were allowed to have lunch in the canteen. I could see many non-student participants would have liked to enjoy a reasonably priced meal there. Something puzzling is there seem to be no page numbers for conference papers on the CD. Finally, once again, it was truly amazing to see how people just love their conference bags.

The next ICSLP will be held in 2006 in Pittsburgh, USA (<http://www.interspeech2006.org>) and INTERSPEECH (formerly EUROSPEECH) 2005 will be in Lisbon, Portugal (<http://www.interspeech2005.org>). Representatives were heavily promoting themselves in the closing ceremony, so I'm sure organizers would be delighted to receive lots of papers from Down Under.

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presented as an attempt to devise an ideal and universal organic phonetic alphabet.

Speech recognition, speech perception, spoken language identification and translation, spoken dialog systems, linguistic phonology and phonetics, biomedical applications of speech analysis, speaker recognition, speaker adaptation, and speaker segmentation and clustering were the main topics presented in the oral sessions.

Other interesting topics presented in the poster sessions were robust speech recognition on AURORA, acoustic modeling, speech science, speech features, speech analysis, spoken/multimodal dialogue system, spoken language generation and synthesis, spoken and natural language understanding, and spoken language resources and technology evaluation.

Australian researchers contributed 16 papers, organized a special session and chaired 2 sessions. Kuldip K. Paliwal from the Griffith University presented 4 papers in robust speech recognition and chaired the Novel Features in ASR session. Michael Wagner from the University of Canberra presented a paper about "liveness" verification in audio-video authentication and chaired the Speaker Recognition session. Chris Davis from University of Melbourne presented 2 papers in audio-visual speech processing & perception and organized the Audio-Visual Speech Processing special session. Bruce Millar from the Australian National University presented 2 papers about

aspects of speaking face data corpus design methodology and the audio-video data corpus AVOZES. Other Australian researchers who contributed/presented papers were Roberto Togneri (University of Western Australia), Benjamin J. Shannon, Leigh David Alsteris and Stephen So (Griffith University), Denis Burnham (University of Western Sydney), Roland Goecke (Autonomous Systems & Sensing Technologies), Kimiko Tsukada (University of Western Sydney), Thomas John Millhouse, Teddy Surya Gunawan, Mehrdad Khodai-Joopari, Michael Barlow and Eliathamby Ambikairajah (University of New South Wales), Julien Epps (NICTA), and Girija Chetty and Dat Tran (University of Canberra).

The Interspeech 2005 will be held from 4<sup>th</sup> to 8<sup>th</sup> of October, 2005 in Lisbon, Portugal. The Interspeech 2006 will be held from 17<sup>th</sup> to 22<sup>nd</sup> of September, 2006 in Pittsburgh, Pennsylvania, USA.

## LAB PROFILES

**What do you do?**  
**Where do you work?**  
**Who do you work with?**

If you would like to profile your lab or research group for the members of ASSTA, please write to me, the Newsletter Editor:  
[dgrayden@bionicear.org](mailto:dgrayden@bionicear.org)

## ASSTA GRANTS PROGRAM

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**ASSTA** manages a number of grants that aim to provide support to members in their research in Speech Science and Technology. Some of the grants are:

**PhD Study Awards** for student members a year into their PhD.

**ASSTA PhD of the Year Award** for the best PhD completed each year.

**Research Event Awards** for research events organised by ASSTA members.

**ASSTA Travel Awards** for travel to conferences.

The **National Lecture Tour Programme** to enable prominent experts to lecture in provincial areas.

Applications for PhD Study Awards, PhD of the Year and Research Event Awards are due on 27 May 2005. Travel awards may be applied for at any time of the year before the conference date. Don't miss these opportunities!

[www.assta.org/initiatives/](http://www.assta.org/initiatives/)

## 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.

Please send your views to the editor and they will be published in this column. The editor will, of course, always exercise editorial discretion. Please also send a brief biography of the author.

### **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 (on CD): \$33.00

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)