



*Australian Speech Science  
and Technology Association  
(Incorporated)*

G.P.O. Box 143, Canberra

# ASSTA Newsletter

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## Editorial

Welcome to the October 2002 issue of the ASSTA Newsletter.

In the President's Report for this issue, Denis talks about the work of Tecumseh Fitch, who was a keynote speaker at the International Conference on Spoken Language Processing, held in Denver last month. A general report on the conference is given by one of our newest student members, Doğu Erdener. I will be looking for a few reports on the SST conference, so don't be surprised if you hear from me!

On page 5, you will find an announcement of the PhD Study Award and Research Event Award recipients. On the following page there is a report from the Forensic Speech Science Subcommittee.

On an administrative note, each quarter when



I post out these newsletters, I inevitably have a number of them returned because members have changed addresses. I will leave some copies of this newsletter at SST, so if you are reading this and you have not been receiving the newsletter of late, please update your membership details with the secretary, Steve Cassidy.

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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).

Send notices or reports on conferences to [Marija Tabain](#). Thesis abstracts and book reviews should be sent to [Johanna Barry](#).

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Please visit ASSTA on the Web:

<http://www.assta.org>



## President's Report

**Denis Burnham**



### **Blinky Bill has a Lowered Larynx**

In 1866 the Linguistic Society of Paris banned further discussion of the evolution of language. Fortunately this has now been lifted, for last month at the International Conference on Spoken Language Processing in Denver, a dinner companion said to me, “You’re Australian; did you know that koalas have a lowered larynx?”. I replied that this was impossible, as I had for years taught my students that adult humans were the only species with a dropped larynx. My companion urged me to attend his presentation the next day. It happened to be the keynote address, and my dinner companion was Professor Tecumseh Fitch, a biologist from Harvard. Here I summarise his lively and somewhat provocative presentation (Fitch, 2002).

It has long been known that adult hu-

mans have a lowered larynx, whereby the soft palate (velum) and the epiglottis are disengaged. This gives us distinct pharyngeal and nasal cavities, and allows us to form various vocal tract shapes resulting in a wide variety of formant patterns (see Lieberman, 1984). (Notably, this is not so in human newborns, which allows them to suck and breathe at the same time, and results in the production of nasal semi-vowels up to about 6 months.) It has been thought that this lowered larynx was unique to adult humans, and evolved specifically for that distinctly human activity that we in ASSTA are concerned with, speech.

Now this argument needs to be revised. Fitch has shown that various other animals, goats, pigs, dogs, and monkeys, lower their larynx during vocalisation, and that their vocal tract shape during vocalisation closely resembles that of humans. What might be the purpose of this? Well, by this means formant-like structures can be produced, and it has been shown that these are perceived by conspecifics. Fitch has also found that, despite notions that F0 and body size are related, body size is much more accurately and honestly conveyed by formant dispersion, which in turn depends upon vocal tract length (Fitch & Reby, 1997). Thus, producing these formant-

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like sounds has an evolutionary advantage – it allows males to advertise their size.

Furthermore, Fitch has found that some mammals have permanently lowered larynges. A striking example is the New Zealand red deer (picture below for a demonstration see Fitch's webpage, and Fitch, 1997). In addition, some other deer, all of the big cats, and our very own koala have a permanently lowered larynx! Why? Fitch speculates that as formants give an accurate representation of size, some animals may use formants to convey false information, i.e., exaggerate their size.

Whether this size exaggeration hypothesis is true or not, we need to rethink the significance of the lowered larynx - while essential for speech as we know it, the lowered larynx evolved in various species for reasons other than speech production. It is even possible it evolved in humans to exaggerate size (note the second lowering of the larynx in pubescent boys). Thus the lowered larynx, while a necessary condition for *speech*, appears to be an



evolutionary option for various animals, rather than the critical step in the evolution of *language* it was once thought to be. This suggests that it is “not the anatomy of the speech production apparatus, but the brain that controls it, that [holds] the key to spoken language” (Fitch, 2002, p. 6).

Future collaboration between speech scientists/technologists, biologists, physiologists, and psychologists holds the key to further understanding of this issue.

### **Bibliography, Further Reading**

- Fitch, T. & Reby, D. (2001) The descended larynx is not uniquely human. *Proceedings of the Royal Society*, 268, 1669-1679.
- Fitch, T. (1997) Vocal tract length and formant frequency dispersion correlate with body size in rhesus macaques. *Journal of the Acoustical Society of America*, 102, 1213-1222.
- Fitch, T. (2002) The evolution of spoken language: A comparative approach. *Proceedings of the 2002 International Conference on Spoken Language Processing*, Denver, Colorado: Center for Spoken Language Research, pp 1-8.
- Lieberman, P. (1984) *The biology and evolution of language*. Cambridge, MA: Harvard University Press.
- Tecumseh Fitch Homepage: <http://www.wjh.harvard.edu/~tec/>



# Research Initiative Recipients

## PhD Study Awards

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The ASSTA Executive is pleased to announce that the following students have been awarded PhD Study Awards. These students will each receive awards of \$500.

- Deborah Loakes, The University of Melbourne, *A Forensic Phonetic Investigation into the Voices of Identical and Non-Identical Twins*.
- Jeannette McGregor, Macquarie University, *High Rising Tunes in Australian English*.
- Natalie Mollow, Macquarie University, *An Electropalatographic (EPG) Investigation of Speech Production in Children and Adults with Repaired Cleft Palates*.
- Akiko Onaka, Macquarie University, *Articulatory and Acoustic Features of Japanese Intonation*.
- Lisa Stephenson, Macquarie University, *Assimilation in English, Japanese and Arrernte*.

## Research Event Award

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We are also please to announce our first Research Event Award. An award of \$5000 will be made to the 6<sup>th</sup> International Seminar on Speech Production

which will be hosted by Macquarie University in December 2003 (see last issue for the conference announcement). The \$5000 from ASSTA will cover the cost of one keynote speaker from overseas and one keynote speaker from Australia. The organising committee is made up of Max Coltheart, Karen Croot, Janet Fletcher, Jonathan Harrington, Sallyanne Palethorpe and Marija Tabain.

## Other Initiatives

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ASSTA manages a number of initiatives that aim to provide support to members in their research in Speech Science and Technology. New initiatives are:

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

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

Details of all initiatives, including application dates, are available at the ASSTA website:

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

**David Grayden**

**ASSTA Executive Member**



# Subcommittee Progress Report



Forensic Speech Science  
Subcommittee Progress Re-  
port

Author: Helen Fraser, Uni-  
versity of New England,  
School of Language Cultures  
and Linguistics

The FSSSC is a 'quiet' sub-committee which exists in order to be able to bring together expertise about the use of speech science, particularly speaker identification, when needed in legal cases. The members are Helen Fraser (UNE), Andy Butcher (Flinders), John Ingram (UQ), Phil Rose (ANU), Miles Moody (QUT), Laura Tolfree (Monash) and John Hajek.(Melbourne).

Recent activities of members of FSSSC include the following:

Phil Rose has worked on several cases involved speaker identification, and has also continued with his research in this area, including presentation of a paper (with Yuko Kinoshita) 'Empirical Confirmation from Forensic Speaker Identification of Theoretical Predictions based on the Likelihood Ratio' at the 16th International Symposium on the Forensic Sciences, ANZFSS, Canberra, and a workshop on Forensic Speaker Identification at the Australian Linguistics Institute in Sydney. He also has a number of postgraduate students work-

ing on forensic speech science topics. His most significant achievement is publication of a new book, *Forensic Speaker Identification* (for more information, the book notice and Yuko Kinoshita's thesis abstract are in the April 2002 newsletter).

Miles Moody has remained active in automatic speaker recognition research, gaining important results in the US National Institute of Standards and Technology (NIST) Speaker Recognition Evaluation - and is beginning to test their methods in the Australian forensic context. Currently Prof Moody and his team are extending their excellent results from English to Vietnamese speech. Read more about Miles Moody and his work at:

<http://www.eese.qut.edu.au/>

Helen Fraser and Andy Butcher have provided advice and reports for a number of cases on speaker identification, transcription accuracy and other issues

More information about FSSSC and about forensic speech science can be obtained from:

<http://www-personal.une.edu.au/~hfraser/forensic.htm>

**Helen Fraser**  
**FSSSC Chair**



# ICSLP2002 Report

**Doğu Erdener**



The International Conference on Spoken Language Processing (ICSLP) took place in Denver, Colorado, between 17-20 September. ICSLP 2002 was the seventh biennial conference on the interdisciplinary study of speech science and technology, attracting many speech scientists, including engineers, computer scientists, linguists, psychologists and speech pathologists. Overall, as my first international conference participation, ICSLP 2002 was a very profitable experience. I presented a poster on my masters research and it was great to receive feedback from such a diverse group of experts.

Tecumseh Fitch, the first keynote speaker, presented on how comparative studies of living animals' vocalisations, their perception and production of formants as well as the descent of the larynx in mammals, provide us with an in-depth understanding of the evolution of speech in humans. The second keynote speaker, Steve

Young's talk was about the use of statistical methods in dialogue systems, which have significant implications in speechreading by machines.

Talks at ICSLP covered the various areas of speech science such as signal processing, natural language processing, second language acquisition, automatic speaker recognition, and there was also a series of special sessions. These covered a variety of areas from the diverse fields of speech science, and of personal interest were the presentations at the special session on Audio-Visual (AV) Spoken Language processing. The talks were multidimensional, reflecting the wide range of interests among researchers from various fields. Topics included AV speech synthesis, perception, speech integration, and second language training.

From a social point of view, the conference dinner was a highlight. Delegates were encouraged to pose for a photo dressed in wild west clothing! This resulted in some prominent researchers in speech giving the audience an idea on the 'shape' of speech science in the wild west.

Denver is a city that conceals its treasures under its thick crust of the Rockies. As I was lucky to stay with a group of friends in the suburbs, I had the opportunity to mingle with the locals and experience the rush hour trips to and from downtown. Local people were



great (at least the ones I met). There seems to be very few doors that won't open when you say you are from Australia! On the other hand, due to the inferior situation of the good ol' Aussie dollar, Denver can be an expensive city to get around, especially eating out and catching cabs.

The next ICSLP will take place at Jeju Island, South Korea, between 4 and 8 October 2004. Detailed information on ICSLP 2004 can be obtained from <http://www.icslp2004.org/>.

### **V. Doğu Erdener**

**MARCS Auditory Laboratories**

*(Continued from page 1)*

This is a concise issue, but next issue will be full of information from SST, and there will be a report on one of the many laboratories associated with ASSTA. There has been little change to the Conference Log from the last issue, so it will return in the next issue. However, please note the following conferences, not in the last conference log, that may be of interest:

*2nd workshop on sociolinguistic,  
phonetic and phonological  
characteristics of /r/.*

Brussels, Belgium, December 1 – 5

[http://www.ulb.ac.be/philolo/  
phonolab/r-atics2/r-atics2.  
htm](http://www.ulb.ac.be/philolo/phonolab/r-atics2/r-atics2.htm)

*2003 Texas Linguistics Society Conference: The Dynamics of Coarticulation in Speech Production and Perception*  
Austin, Texas, USA, March 7 - 9

**Information:** [tls@uts.cc.  
utexas.edu](mailto:tls@uts.cc.utexas.edu)

*4th International Conference on Audio and Video Based Biometric Person Authentication*

Guildford, UK, June 9-11, 2003

[http://avbpa2003.ee.surrey.  
ac.uk/](http://avbpa2003.ee.surrey.ac.uk/)

I look forward to seeing you all at SST in Melbourne. I'm sure it will be a great conference. If you have any ideas or suggestions about the newsletter, please don't hesitate to come and see me at the conference.

**Michael Tyler**

## The 5 Column?

**Have you got something to say about ASSTA? Let us hear your views. Please write to me, the Newsletter Editor:**

[m.tyler@uws.edu.au](mailto:m.tyler@uws.edu.au)

If you wish, also send me a brief biography. This is a good way to publicise your work and your views on Speech Science and Technology in Australia.