

Résumé

Jeremy Goslin

Born 11th June 1971 in Lincoln, UK, British national

Contact Information

Email: jeremy@jeremygoslin.com

www: <http://www.jeremygoslin.com>

Personal

Address: 8 rue du Jura,
74100 AMBILLY
France

Professional

Address: F.P.S.E,
Université de Gèneve,
40 Bd du Pont d'Arve,
CH1205 Gèneve
Switzerland

Telephone: (+33) 450842735

Telephone: (+41) 22 7059374

Academic Qualifications

1994 - 2002 Doctorate of Philosophy entitled 'A Comparison of Theoretical and Human Syllabification'.

Supervised by Prof. Martin Cooke at the Speech and Hearing Research Group, Department of Computer Science, University of Sheffield, UK.

1993 – 1994 Master of Science in Speech and Language processing
Department of Linguistics, University of Essex, UK.

1989 – 1993 Bachelor of Engineering (Honours) in Information Technology
(computing, microelectronics and communications)
Department of Electronic Engineering, Staffordshire University, UK.

Employment

2001 - Research assistant
Research and development of systems for the investigation of computer mediated problem solving and collaboration using both standard and ubiquitous interfaces.
Under the direction of Prof. Pierre Dillenbourg at Tecfa, Faculty of Psychology and Sciences of Education, University of Geneva, Switzerland.

1998 - 2001 FNRS research assistant
Research on speech perception, specifically, empirical and statistical techniques for the investigation of syllabic segmentation. Under the direction of Prof. Ulrich Frauenfelder at the Laboratory of Experimental Psycholinguistics, Faculty of Psychology and Sciences of Education, University of Geneva, Switzerland.

1990 – 1991 Computer hardware and software engineer
Involved in the development and testing of distributed Unix minicomputer systems, including environmental and usability testing, and the development of evaluation software. International Computers Limited, Bracknell, UK.

Teaching

1999 - 2001 Developmental and Conceptual Psychology – parallels in Computer Science and Artificial Intelligence
An undergraduate course with theoretical and practical components comparing theoretical models of developmental psychology in young children with concepts used in AI and computer science. Practical work involved the programming, and comparison, of simple algorithms that model early abilities in cognitive development.
Department of Psychology, Université de Franche Comté, Besançon, France (50 hours/year).

1994 – 1997 Teaching assistant (various)

Assisting in undergraduate courses for Speech Signal Processing, Basic Computing, and C/C++ programming. Department of Computer Science, University of Sheffield, UK (total of 100 hours/year).

Publications

Journal Publications

Goslin, J., & Floccia, C., (submitted for publication). Syllabification rules for consonant cluster words in French : a developmental perspective.

Floccia, C., **Goslin**, J., Schneider, R., & Thommen. E. (2003) Linguistic and conceptual development in the child aged from one to six years, *Developmental Science* 6:2, pp. 121–123

Goslin, J., & Frauenfelder, U.H. (2000). Theoretical and human syllabification, *Language and Speech*, 44(4), pp. 409-436.

Conference Proceedings under Peer Review

Goslin, J., Content, A., & Frauenfelder, U.H. (1999). Syllable segmentation: are humans consistent? *Proceedings of Eurospeech '99, Budapest, 1999*.

Goslin, J., Content, A., Goldman, J.-P., & Frauenfelder, U.H. (1999). *Human and machine syllabification in French : a comparison*. *Proceedings of the Linguistic Studies Workshop, Nantes, 1999*.

Floccia, C., **Goslin**, J., Bouketir, N., & Bradmetz, J. (1999). Consonant Cluster Syllabification in Children. *Proceedings of the Linguistic Studies Workshop, Nantes, 1999*.

Conference Presentations

Goslin, J. (2001). SPACE: Spatially Perceived Augmented Control Environment. *Invited presentation at A2B: Architecture Symposium, Basel, 2001.*

Goslin, J. (2001). Magic Cube - a mixed reality interface for collaborative environments, *TECFA workshop, Sonloup, 2001.*

Goslin, J., Content, A., & Frauenfelder, U. H. (1999). L'influence de l'ouverture et du type de la voyelle sur la syllabification. *Colloque de linguistique du Pôle Rhône Alpes des Sciences de la Cognition, November 1999, Lyon.*

Conference Organisation

- 1999/2000 Participation in the organisation of the 1st Bisontine Conference for Conceptual and Linguistic Development in the Child Aged from 1 to 6 Years (DECOLAGE 99), Besançon, December 1999.
International conference with peer review of published proceedings.
- 2000/2001 Participation in the organisation of the 2nd Bisontine Conference for Conceptual and Linguistic Development in the Child Aged from 1 to 6 Years (DECOLAGE 2001), Besançon, December 2001.
International conference with peer review of published proceedings, selected presentations also published in a special edition of the journal Developmental Science.

Software Development

Applied competences in software development using C++, C in the following areas:

3D graphics using OpenGL
3D sound using DirectSound
Speech and sound processing
Voice over IP
Video and peripheral support, using DirectShow and DirectInput

Languages

Maternal Language: English

Other Languages: French

Research Activities

My main research focus lies in the investigation of communication and interaction, and the development of tools that can be used to model, examine, or enable these processes. My interests range from the investigation of psychological models of speech and perception, and their application in speech technology, to the examination of collaborative behaviour in virtual environments.

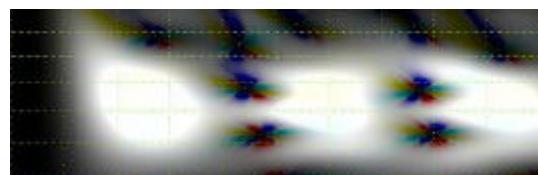
It is my belief that a multidisciplinary approach to research in the areas of experimental psychology and human computer interaction can result in important insights in both areas. For example, Virtual environments can be used in the development of experiments in cognitive and behavioural psychology that would not be possible using standard methods. Moreover, they allow for controlled and repeatable experimentation in ecologically valid settings. Similarly, psychological models of perception and interaction offer important insights in interface design. The empirical results of even pure empirical research can be fed back into improvements in experimental virtual environments. Additionally, applied empirical experimentation specifically tailored towards interface design are also essential to the development of new techniques.

Whether the statement of intent is the use of empirical experimentation for the design of virtual environments, or vice versa, it is clear that both fields profit, highlighting the interdependency of the two areas of research.

Low Frequency Amplitude Modulation Patterns in Speech

In the field of speech signal processing there is considerable interest in the investigation of acoustic cues that are robust in conditions of environmental noise. One area of interest has been highlighted by a number of psycho-acoustic studies that show the importance of low frequency amplitude modulation in speech intelligibility.

To examine the possible applications of low frequency amplitude modulation patterns a study was conducted to examine low frequency changes in instantaneous frequency and amplitude from adjacent gamma-tone filter bank channels. This required using an extension of the normal spectrogram into the HSV colour space so that a greater number of variables can be displayed, in this case to show variations in IF.



Instantaneous Frequency Spectrogram

These variations in IF were found to be particularly robust to noise, especially the points of maximal 'AM' in speech signals, along with the behaviour of IF changes around these points. It is suggested that these representations show particular promise in the recognition of noisy speech. One particular application that was the detection of the pitch period of a speaker's voice.

Modelling Segmental Speech Perception

Phonology is replete with theories and principles governing the process of syllable segmentation. However, with a myriad of conflicting theories available, a major problem facing researchers wishing to apply the syllable unit in models of speech processing is in selecting which of these theories to use in their definition of the syllable. In this study the predictions of these theories was examined using lexical statistics and the experimental findings of a series of psycholinguistic syllable segmentation and perception experiments.

A number of factors have been found to influence syllable segmentation. These include, the nature of intervocalic consonant clusters and singletons. The aperture of the vowel at the nucleus of a syllable, with an open vowel inducing closed syllables, and vice versa. Also, orthographic bias, which, at the onset of literacy can influence syllabification decisions in metalinguistic tasks. Also important differences between syllable onset and offset detection were revealed.

These findings suggested that listeners are taking advantage of a number of separate cues when segmenting speech into syllables. However, even when factoring these effects into the segmentation responses of subjects, there is still considerable variability in subject segmentation responses. By implementing the factors found to influence syllabification thus far, it is possible to suggest a set of preference rules which can predict where the boundary is *likely* to be located, and also to predict in which situations the location of the syllable boundary is likely to be most ambiguous.

Investigation of Problem Solving and Collaboration in Virtual Environments

One of the problems in the investigation of virtual multi-user environments is the design of controlled and repeatable experiments that maintain ecological validity. That is, to design an experimental environment that would allow complete control, and analysis, of all communication and interaction of users in an immersive multi-user environment whilst allowing the presentation of complex problem solving tasks and maintaining subject motivation.

To this end the SpaceMiners experimental platform was developed, an interactive multi user problem solving game. The use of the game paradigm was chosen to make the task enjoyable to the user, thus maintaining high levels of motivation amongst subjects.

In SpaceMiners the users have to launch ships in slingshot orbits around planets to collect asteroids. A variety of tools are also distributed to the users that can modify the environment. Users must decide, and communicate, strategies for the fulfilment of their objectives using the given space and available tools.



The SpaceMiners virtual environment

The configuration and distribution of tools and objects in space can be customised to test, or elicit, any type of behaviour under analysis. The environment can also be configured to examine the impact of cues used in 3D perception, manipulation and navigation, using vision and sound, and also simple tactile feedback.

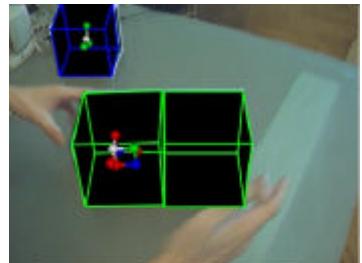
Initial experiments using the SpaceMiners system examined the effect of awareness cues on the mutual modelling of users. Current experiments examine the behaviour of subjects when presented with classical game theory scenarios, with additional information drawn from more classical psychological instruments. These experiments are being conducted using two subject pools, students, and officers and men of the Swiss Army.

Experimental Examination of Augmented Reality Environments for Collaboration

Augmented Reality, designed to overcome the disadvantages of current computer interfaces by widening the *interface* to a true *environment*, merges the real and virtual worlds, providing a single interface onto both worlds. This approach is designed to allow the use seamless of intuitive interfaces based upon real world experience and skills, and is of particular interest to those interested in collaborative computing. However, few empirical studies have been performed to evaluate the behaviour of users in these environments, especially when compared to standard interfaces, to establish whether the promises of Augmented Reality can be realised.

The SPACEcube project builds upon the distributed architecture of the SpaceMiners environment, by adding an Augmented Reality interface to the virtual world presented by the standard SpaceMiners client.

Using existing optical fiducial tracking techniques, coupled with Head Mounted Displays, users can view the SpaceMiners environment as a part of their real world environment. The virtual game space is



SPACEcube prototype - molecules

presented using the metaphor of a tabletop 'hologram', with a user definable control cockpit, direct control and navigation of the interface is through direct manipulation of the body and hands of the user.

The aims of this project are the examination of differences in the behaviour and competences of users with the augmented and standard interface with special interest in navigation, manipulation and collaboration. The system allows a mix of interfaces to be used in parallel, with different users controlling the common environment using different interfaces. This allows a direct analysis of differences in user behaviour due to the interface.