

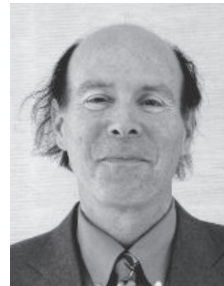
## Center for Language Research



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The Center for Language Research (CLR), in the School of Computer Science and Engineering, was established in 1993 to contribute to the development of professionals in computer science, computer engineering, and related fields through

## Centers

the research and teaching of successful language use in academic and workplace contexts – in particular, the use of English for academic and professional purposes. Faculty research focuses on language theory, use, pedagogy, and acquisition as well as on supporting educational technologies. Grounded in this research, CLR faculty provide innovative English language training to University of Aizu students at the graduate and undergraduate levels, as well as to university students and faculty at other universities around the world via keynote speeches, conference presentations, training seminars, and workshops. Researchers interested in applying for a position in the CLR or collaborating with CLR faculty on joint projects should contact the CLR Office at [clr-office@u-aizu.ac.jp](mailto:clr-office@u-aizu.ac.jp).

## Refereed Journal Papers

- [brine-01:2012] Alexander Vazhenin Ruth Cortez and John Brine. Wikipedia Miner Engine: A Re-usable e-Learning Service based on a Virtual MVC Design Pattern. *Frontiers in Artificial Intelligence and Applications*, 246:165–179, September 2012.

E-Learning platforms are evolving from monolithic applications with a rigid structure that did not allowed for the exchange of tools or components to applications incorporating service orientation concepts as well as facilitating the dynamic discovery and assembling of e-learning services. Accordingly, the usage of support materials to provide additional guidance to students facilitates the comprehension of learning tasks. Wikipedia is one of the richest sources of human knowledge, encompassing a vast range of topics of all kinds of information, and content, which is in constant change due to its collaborative dynamic nature. The Wikipedia Miner provides a code that can parse a given document identifying main topics and link them to corresponding articles or short definitions from the Wikipedia content. In this paper, we discuss the realization of a reusable Wikipedia Miner service for the e-Learning Computational Cloud (eLC2) Platform designed with the J2EE technology and Service-Oriented (V-MVC) model excluding a direct link between the Model and the View. This allows enhancing the Controller as a middleware, removing the dependency and acting as a single point of contact. In the V-MVC design pattern, the Controller is modeled by the compound design pattern of the Enterprise Service Bus (ESB) supporting higher privacy of the business logic and higher re-usability Architecture standards. The eLC2 is also based on an original Virtual Model-View-Controller of application components. In this framework, Wikipedia Miner services were prototyped as an Application Engine that wraps the logic of the Wikipedia Miner API in order to re-use it for different types of applications. Particularly, we are focusing on two applications in order to demonstrate the usability of the proposed approach. The first application is the WikiGloss tool, which is based on a glossing approach to help learners of English-as-second-language with an extensive reading task. The second application is an Intelligent Hints service for a Task Management Environment which provides explanatory links from relevant Wikipedia articles related to topics of the e-Learning task. This allows re-use of the same problems in different task type modes such as lectures, exercises, and quizzes.

- [kaneko-01:2012] Emiko Kaneko. “On the Motivation of Science Majors Learning

## Summary of Achievement

English as a Second Language: A Case Study from Japan". *OnCue Journal for the Language Professional in Higher Education*, 6(2):3–26, 2012.

English has now become a global language, which necessitates reconsideration of Second Language (L2) motivation, especially integrative motivation in an EFL context. In the L2 Motivational Self System recently advanced by Dörnyei, integrative and instrumental motivation are reformulated as a single, inseparable concept. The present study examines how the motivation of Japanese EFL learners may be influenced by opportunities to listen to lectures in English given by possible Japanese role models as the students reflect upon their future self-images. The students were all computer science majors in a rural area in Japan. Under two kinds of measures, a questionnaire with open-ended questions and a modified Attitude/Motivation Test Battery, the changes in English L2 motivation were examined qualitatively. The results indicate that there were several types of positive changes, possibly caused by the development of their ideal L2 selves. Though learner motivation is influenced by many factors, exposure to established members of a target language community can partly account for these changes.

[naomi-o-01:2012] Anna Danielewicz-Betz and Naomi Ogasawara. Truth statements in denial context: A study of prosodic, paralinguistic, and discursive cues in Japanese speakers. *Journal of Forensic Research, Special Issue*, 11:1–10, 2013.

Conference Proceedings

[naomi-o-02:2012] Naomi Ogasawara. Lexical representation of Japanese vowel devoicing. *Language and Speech*, 56(1):5–22, 3 2013.

Social Sciences Citation Index Journal

## Unrefereed Papers

[wilson-01:2012] I. Wilson. Articulatory settings of French and English monolinguals. *Sophia University Working Papers in Phonetics*, pages 39–58, March 2013.

This research has shown that articulatory setting (AS), observed through the window of inter-speech posture (ISP) of the articulators, is significantly different between Canadian English and Quebecois French, across monolingual groups.

The ISP components that differ across these languages between monolingual groups are upper and lower lip protrusion, tongue tip height, and the degree to which the corners of the mouth are drawn towards the midsagittal plane from a maximally-spread position. In Canadian English, the upper and lower lips are significantly more protruded, the tongue tip is higher, and the corners of the mouth are drawn farther toward the midsagittal plane.

[wilson-02:2012] I. Wilson and Y. Hashimoto. Voice onset time and the perception of Japanese voicing contrasts. *Journal of Nagoya Gakuin University – Language and Culture*, 24(2):15–22, March 2013.

Much crosslinguistic research exists on the production and perception of voice onset time (VOT). However, most research on the perception of VOT uses synthetic stimuli instead of natural speech stimuli. Effects of synthetic speech on the perception of VOT are not known, but more research needs to be done to see if there are differences between perception using synthetic speech and perception using natural speech. This pilot study uses natural speech to investigate perception of Japanese VOT by Japanese listeners. Results clearly show that not just VOT, but other phonetic factors too must be responsible for differences in perception of the voiced-voiceless distinction in Japanese word-initial stop consonants.

## Refereed Proceeding Papers

[kaneko-02:2012] Emiko Kaneko. “The impact of pseudo-speaking practices on L2 spontaneous speech,”. In *Institute of Electronics, Information and Communication Engineers (IEICE) Technical Report*, pages 73–78, 2012.

In the field of second language acquisition, mechanical practices such as shadowing and repeating are somewhat outdated. In the context of English as a foreign language (EFL), however, many learners suffer from strong anxiety to speak English naturalistically, and such mechanical training might provide scaffolding to them. This kind of training is also expected to make the processing of working memory more efficient, leading to better L2 oral proficiency. In this ongoing research, non-communicative, or pseudo-speaking, practices were conducted with Japanese university students majoring in computer science, and its effects on their spontaneous speech were investigated in terms of complexity, accuracy and fluency. As a result of 11 short training held once a week, significant interactions were found between group (control vs. experimental)

## Summary of Achievement

and time (pre- and post-tests) on fluency and complexity, suggesting that the pseudo-speaking practices have positive effects on spontaneous speaking.

- [wilson-03:2012] I. Wilson, D. Erickson, and N. Horiguchi. Articulating rhythm in L1 and L2 English: Focus on jaw and F0. In *Proceedings of the 2012 Autumn Meeting of the Acoustical Society of Japan (ASJ)*, pages 319–322, 2012.

Articulatory/acoustic recordings were made of two native speakers of American English and five Japanese speakers of English. Jaw displacement measurements and average F0 were made for each syllable in the utterances. Patterns of jaw displacement and F0 were systematic for the native speakers, but those for the Japanese speakers varied. Evaluations by American university students as to how native-like the Japanese-English utterances sounded showed groupings of skill levels, which corresponded well to the observed patterns of jaw movements and F0. Future work along these lines will explore how to apply these findings to improved teaching of spoken English to Japanese learners of English. The findings of this study could also be applied to creation of more realistic avatars/talking heads.

- [wilson-04:2012] Y. Yaguchi, N. Horiguchi, and I. Wilson. Finding phoneme trajectories in a feature space of sound and midsagittal ultrasound tongue images. In *IEEE Proceedings of the 4th International Conference on Awareness Science and Technology (iCAST 2012)*, pages 156–162, 2012.

doi:10.1109/iCAwST.2012.6469606. Supporting the development of a pronunciation learning system, this paper reports an inspection of the trajectory of speech sentences in a feature space that is constructed from midsagittal tongue images and frame-wise speech sounds. One objective of this research is to estimate tongue shape and position from speech sounds, so we focus on determining how best to construct and interpret a feature space we call MUTIS (midsagittal ultrasound tongue image space). Experimental results indicate that higher dimensions of MUTIS are most effective for separating people, and that primarily the lower dimensions of VSS (vocal sound space) data are most effective for separating phonemes. Also, the trajectories within only the VSS data indicate clear differences between first language and second language speakers, but they do not do so within only the MUTIS data. These results indicate that the ultrasound tongue image expresses individual oral cavity over a wide area, and specific tongue shape has a lower contribution in ultrasound tongue images.

- [wilson-05:2012] K. Sano, Y. Yaguchi, and I. Wilson. Comparing L1 and L2 phoneme trajectories in a feature space of sound and midsagittal ultrasound tongue images. In *Journal of the Acoustical Society of America*, volume 132, page 1934, 2012.

doi:10.1121/1.4755107. To support the development of pronunciation training systems for non-native (L2) speakers, past research has proposed visualization of a speaker's tongue using ultrasound as feedback showing differences between L2 and native (L1) speakers. However, there has been little or no quantitative assessment combining temporal variation of speech sounds and ultrasound tongue images. We propose a mining method to analyze such temporal differences between L1 and L2 speakers. We firstly construct two eigenspaces: one made from feature vectors of speech sounds using Spectrum Vector Field (SVF) and the other from ultrasound tongue images using Histogram of Oriented Gradients (HOG). Next, we compare the movements of L1 and L2 trajectories. Furthermore, we model the connection of phonemes by finding tongue shapes from adjacent speech sounds, and we indicate the differences between L1 and L2 speakers to make a clear intermediate representation from the feature space. In our experiment, we analyze the differences between L1 and L2 pronunciation by focusing on the temporal trajectories of the feature space. These trajectory differences between L1 and L2 speakers' speech sounds will be presented. We will also present the feature space of ultrasound tongue images that indicate the intermediate tongue shapes mentioned above.

- [wilson-06:2012] J. Okada, I. Wilson, and M. Yoshizawa. Pitch and intensity in the speech of Japanese speakers of English: Comparison with L1 speakers. In *Journal of the Acoustical Society of America*, volume 132, page 2004, 2012.

doi:10.1121/1.4755421. The speech of L2 learners of English is often difficult to understand because of intonation problems and misplaced word stress. In this research, we investigated whether or not the intonation patterns of Japanese speakers of English show common patterns based on proficiency level. First, we recorded 'The North Wind and the Sun' from 50 Japanese undergraduate students (aged 18 to 24). We recorded native English speakers and also obtained such native data online. Next, we labeled each word and analyzed the pitch and intensity using Praat. Data was separated by gender and by proficiency in English, results were plotted, and statistical analysis was undertaken. Preliminary results show that pitch (and to a lesser extent, intensity) showed a common

## Summary of Achievement

pattern across native speakers, but that L2 speakers relied on intensity much more than pitch in the production of stress.

[wilson-07:2012] Y. Abe, I. Wilson, and D. Erickson. Video recordings of L1 and L2 jaw movement: Effect of syllable onset on jaw opening during syllable nucleus. In *Journal of the Acoustical Society of America*, volume 132, page 2005, 2012.

doi:10.1121/1.4755428. Video is a convenient, inexpensive method of recording data for jaw movement during speech. However, when using markers attached to the chin, it is possible that the data will not represent actual mandible motion, because of the skin stretching over the mandible - especially true for labial consonants. In this study, we made video recordings of L1 and L2 speakers of English saying 5 trials of 34 sentences each, and we automatically measured the distance between paper markers attached to the chin and glasses. We compared jaw opening during syllable nucleus for syllables with and without labial onsets, for L1 and L2 English speakers of various proficiencies. Although speakers must stretch the lower lip upwards for a labial constriction, preliminary results show that there are no statistically significant differences for any speaker's jaw opening during the nucleus of non-labial- versus labial-onset syllables. There is also very little intra-subject variation in the metrical structure (as measured by jaw opening) for a given sentence across trials. However, across-trial variability in the time between jaw movement peaks is a lot less for L1 than for L2, presumably because these L2 speakers have not yet mastered the metrical structure of English.

[youngheo-01:2012] Younghyon Heo and Hanyong Park. American Learners' Identification of Korean Vowel Categories. In Kuno et al., editor, *Harvard Studies in Korean Linguistics*, volume , pages 77–84. Hanguk Munhwasa, 2012.

This paper investigates how American learners of Korean perceive Korean vowels in terms of their native (L1) categories and what the result bears on their acquisition of Korean vowels. By combining the results of two perception experiments, this paper shows ease or difficulty in the acquisition of Korean vowels is attributable to how second language (L2) vowels are perceptually mapped onto L1 categories.

## Unrefereed Papers



## Books

[rozycki-01:2012] N. Namai, K. Kikuchi, W. Rozycki, and M. Shimura. *Discovery: English Communication I*. Kairyudo, 2013.

Textbook for Japanese high school use in English courses

[wilson-08:2012] B. Gick, I. Wilson, and D. Derrick. *Articulatory Phonetics*. Wiley-Blackwell, Chichester, UK, January 2013.

ISBN:9781405193207. This book presents a concise and non-technical introduction to the physiological processes involved in producing sounds in human speech. With a primary focus on the basic anatomy and physiology of speech and how different kinds of speech sounds are made, the text serves as an ideal guide through this burgeoning area of research. The authors trace the path of the speech production system through to the point where simple vocal sounds are produced, covering the nervous system, muscles, respiration, and phonation. Subsequent chapters continue through the supralaryngeal system with focus on particular sounds of human speech, and introduce some of the more complex anatomical concepts of articulatory phonetics, including coarticulation and articulatory conflict. The most current methodologies, measurement tools, and theories are also addressed. Chapter-by-chapter exercises and a series of original illustrations take the mystery out of the anatomy, physiology, and measurement techniques relevant to speech research.

## Chapters in Book

[rozycki-02:2012] U. Connor and W. Rozycki. *Encyclopedia of Applied Linguistics*, pages 1617–1620. John Wiley, 2013.

[rozycki-03:2012] U. Connor and W. Rozycki. *Blackwell Handbook of ESP*, pages 427–444. Wiley Blackwell, 2013.

Editors B. Partridge and S. Starfield

## Grants

[kaneko-03:2012] Emiko Kaneko. 科学研究費補助研究（KAKENHI 基盤研究 C：課題番号 22520571）「作動記憶効率化訓練と英語口頭運用能力との関連。自動採点型テストへの示唆, 2010-2012.

## Summary of Achievement

- [kaneko-04:2012] Jason Ginsburg et al. Subsidy of the Fukushima Prefectural Foundation for Advancement of Science and Education (疑問文の統語構造と音声構造の分析事業 2012).
- [kaneko-05:2012] Yukio Tono et al. 科学研究費補助研究 (KAKENHI 基盤研究 A : 課題番号 24242017) 「学習者コーパスによる英語 C E F R レベル基準特性の特定と活用に関する総合的研究」, 2012-2015.
- [naomi-o-03:2012] Emiko Kaneko, Younghyon Heo, Naomi Ogasawara, and Ian Wilson. Perception of Aizu dialect, 2013.  
福島県財団研究助成
- [rozycki-04:2012] W. Rozycki. Comparative study of comprehension and audience acceptance of oral research presentation styles, 2011-2013.  
JSPS grant #23520753
- [wilson-09:2012] J. Ginsburg, E. Kaneko, I. Wilson, and N. Ogasawara. FY 2012 Subsidy of the Fukushima Prefectural Foundation for Advancement of Science and Education (KENZAIDAN), 2012.
- [wilson-10:2012] I. Wilson. JSPS Grant-in-Aid for Scientific Research (Acad. Research Subsidies) KAKENHI 23520467, 2011-2014.

## Academic Activities

- [kaneko-06:2012] Emiko Kaneko, 2012.  
研究会運営委員会委員、JLTA Journal 査読委員
- [naomi-o-04:2012] Anna Danielewicz-Betz and Naomi Ogasawara, 10 2012.  
Oral presentation, title “Prosodic, discursive, and paralinguistic cues in truth-telling statements: a Japanese study”
- [wilson-11:2012] J. Ginsburg, E. Kaneko, N. Ogasawara, and I. Wilson, October 2012.  
Refereed Presentation, Intonation used to contrast interrogative sentences in the Inawashiro dialect of the Aizu region. At the International Workshop on Endangered Dialects, a pre-conference workshop at the 22nd Japanese/Korean Linguistics Conference (J/K22), Tokyo, Japan.

[wilson-12:2012] J. Ginsburg, E. Kaneko, N. Ogasawara, and I. Wilson, January 2013.

Refereed Presentation, Intonation of Wh-questions in the Aizu dialect. At International Conference on Phonetics and Phonology (ICPP 2013), Tokyo, Japan.

[wilson-13:2012] D. Erickson and I. Wilson, March 2013.

Presentation, Articulatory and laryngeal contributions to rhythm in English. At Joint Research Meeting of the Department of Linguistic Theory and Structure, NINJAL, Tokyo, Japan.

[wilson-14:2012] I. Wilson and N. Horiguchi, August 2012.

Refereed Presentation, How accurately people follow articulation instructions. At the 4th Pronunciation in Second Language Learning and Teaching conference (PSLLT 2012), Vancouver, Canada.

## Ph.D and Others Theses

[wilson-15:2012] Yusuke Abe. Graduation Thesis: Video recordings of L1 and L2 jaw movement: Effect of syllable onset on jaw opening during syllable nucleus, School of Computer Science and Engineering, March 2013.

Thesis Advisor: I. Wilson, Referee: Prof. Y. Yaguchi

[wilson-16:2012] Jun Okada. Graduation Thesis: Pitch and intensity in the speech of Japanese speakers of English: Comparison with L1 speakers, School of Computer Science and Engineering, March 2013.

Thesis Advisor: I. Wilson, Referee: Prof. Y. Yaguchi

## Others

[naomi-o-05:2012] Ogasawara Naomi and Anna Danielevicz-Betz. Acoustic and para-linguistic characteristics in speech of truth-telling and lying, 2013.

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