

DR. CHRISTOPHER CARIGNAN

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SUMMARY

Laboratory phonetician specializing in the relation between physical articulatory gestures of speech and the corresponding acoustic output, with a focus on many-to-one articulatory-acoustic mappings, computational modeling of how multimodal vocal tract actions relate to the acoustic signal, and innovations in computational techniques to process and analyze large-scale speech kinematic data.

My long term goals are three-fold: 1) to achieve accurate modeling of speech articulation to acoustics, as well as acoustic-to-articulatory inversion, for which we have not yet attained satisfactory results that generalize across speakers and languages. 2) to use this modeling to help explain synchronic and diachronic patterns in speech production and change. 3) to innovate large-scale speech kinematic data analysis methods that advance academic, clinical, and industrial applications of speech data.

EDUCATION

University of Illinois at Urbana-Champaign	<i>Urbana, IL, USA</i>
Ph.D. — French (Linguistics)	2013
University of Illinois at Urbana-Champaign	<i>Urbana, IL, USA</i>
M.A. — French (Linguistics)	2009
Western Washington University	<i>Bellingham, WA, USA</i>
B.A. — Linguistics, French	2005
Graduated <i>magna cum laude</i> with Honors in Linguistics	

POSITIONS HELD

Institut für Phonetik und Sprachverarbeitung <i>Ludwig-Maximilians-Universität München</i>	<i>Munich, Germany</i>
Scientific Staff	2017 – present
Ampersand <i>Elsevier</i>	<i>Oxford, United Kingdom</i>
Editorial Board — Editor: Phonetics & Phonology	2016 – present
The MARCS Institute for Brain, Behaviour and Development <i>Western Sydney University</i>	<i>Sydney, Australia</i>
Adjunct Researcher — Speech and Language	2017 – present
Research Lecturer, Level B (US: Assistant Professor) — Speech and Language	2015 – 2017
North Carolina State University	<i>Raleigh, NC, USA</i>
Postdoctoral Research Scholar — Linguistics program	2013 – 2015
The Executive Voice, LLC	<i>New York, NY, USA</i>
Computational Consultant	2013

RESEARCH EXPERIENCE

The MARCS Institute for Brain, Behaviour and Development	<i>Sydney, Australia</i>
Research Affiliate — ARC Centre of Excellence for the Dynamics of Language	2016 – present
Analysis of Human Articulatory Actions (AHAA) Laboratory Coordinator	2015 – 2017
Université Stendhal-Grenoble 3	<i>Grenoble, France</i>
Research Affiliate — GIPSA-lab: Département Parole-Cognition	2011 – 2012
University of Illinois at Urbana-Champaign	<i>Urbana, IL, USA</i>
Phonetic & Phonology Laboratory Assistant — Linguistics Department	2009 – 2011
Research Assistant — Linguistics Department, French Department	2007 – 2011

TEACHING EXPERIENCE

Western Sydney University	<i>Sydney, Australia</i>
Lecturer in Linguistics — School of Humanities and Communications Arts	2015 – 2017
North Carolina State University	<i>Raleigh, NC, USA</i>
Linguistics Lecturer — Department of English	2013 – 2015
Université de Bourgogne	<i>Dijon, France</i>
English Lecturer — Département Anglais	2011 – 2012
University of Illinois at Urbana-Champaign	<i>Urbana, IL, USA</i>
French Lecturer — French Department	2006 – 2011

TECHNICAL STRENGTHS

PROGRAMMING LANGUAGES

R

Time-series analysis; artificial neural networks; gradient boosting machines; support vector machines; latent factor and component analysis; ultrasound tongue contour spatial analysis; kinematic data generation based on automatic image recognition and classification; modeling the contribution of articulatory factors to acoustics; statistical validation and prediction.

Matlab

GUI-based tools for processing, filtering, and analyzing acoustic, aerodynamic, video, and kinematic data; three-dimensional vocal tract modeling from EMA data; acquisition of aerodynamic data; synchronization of multiple data streams; GUI-based tools for analyzing characteristics of change in ultrasound and MRI video; automatic tongue contour detection in ultrasound video; two- and three-dimensional rigid body transformation of images, planes, and coordinates.

Praat

Spectral analysis of audio data; pitch analysis; computation and processing of nasalance data; processing and measurement of EGG data; automation of spectral and dynamic speech metrics for voice assessment and intervention; automation of audio splicing, spectral manipulation, and stimuli modification and synthesis; speech segmentation and annotation; data visualization.

Python

Automatic segmentation of speech (forced alignment); online data extraction; text manipulation.

RESEARCH EQUIPMENT

Production

Electromagnetic articulography (EMA), real-time structural magnetic resonance imaging (rtMRI), ultrasound, aerodynamics, nasalance, electroglottography (EGG), electropalatography (EPG).

Perception

Eye tracking (Eyelink 1000), E-Prime.

PRODUCTS

HARDWARE

Derrick, D., Carignan, C., Chen, W.-R., Shujau, M., & Best, C. (2018). “Three-dimensional printable ultrasound transducer stabilization system.” *Journal of the Acoustical Society of America*, 144(5), EL392–EL398.

SOFTWARE

Carignan, C. (2014). TRACTUS (Temporally Resolved Articulatory Configuration Tracking of UltraSound) software suite. URL: <http://christophercarignan.github.io/TRACTUS>.

DATABASES

Carignan, C., Shosted, R., & Fagyal, Z. (2013). Northern Metropolitan French acoustic, EMA, and aerodynamic database. URL: <http://www.christophercarignan.com/products/nmf-database>.

PUBLICATIONS

CITATION SUMMARY

Google Scholar: 324 citations, Hirsch Index: 10, i10 index: 10. Google Scholar profile located [here](#).

JOURNAL ARTICLES

Egurtzegi, A., & Carignan, C. (*under review*). “An acoustic description of Mixean Basque.” *Journal of the Acoustical Society of America*.

Shaw, J., Carignan, C., Agostini, T., Mailhammer, R., Harvey, M., & Derrick, D. (*under revision*). “Lenition and Timing: the case of Iwaidja.” *Language*.

Carignan, C. (2019). “A network-modeling approach to investigating individual differences in articulatory-to-acoustic relationship strategies.” *Speech Communication*, 109, 1–14.

Carignan, C. 2018a. “Using naïve listener imitations of native speaker productions to investigate mechanisms of listener-based sound change.” *Laboratory Phonology: Journal of the Association for Laboratory Phonology*, 9(1): 18, 1–31.

Carignan, C. 2018b. “Using ultrasound and nasalance to separate oral and nasal contributions to formant frequencies of nasalized vowels.” *Journal of the Acoustical Society of America*, 143(5), 2588–2601.

Derrick, D., Carignan, C., Chen, W.-R., Shujau, M., & Best, C. (2018). “Three-dimensional printable ultrasound transducer stabilization system.” *Journal of the Acoustical Society of America*, 144(5), EL392–EL398.

Blackwood Ximenes, A., Shaw, J. A., & Carignan, C. (2017). “A comparison of acoustic and articulatory methods for analyzing vowel variation across American and Australian dialects of English.” *Journal of the Acoustical Society of America*, 142(1), 363–377.

Carignan, C. (2017). “Covariation of nasalization, tongue height, and breathiness in the realization of F1 of Southern French nasal vowels.” *Journal of Phonetics*, 63, 87–105.

Kalashnikova, M., Carignan, C., & Burnham, D. (2017). “The origins of babytalk: Smiling, teaching, or social convergence?” *Royal Society Open Science*, 4(8), DOI: 10.1098/rsos.170306.

Mielke, J., Carignan, C., & Thomas, E. R. (2017). “The articulatory dynamics of pre-velar and pre-nasal /æ/-raising in English: An ultrasound study.” *Journal of the Acoustical Society of America*, 142(1), 332–349.

Carignan, C., Shosted, R., Fu, M., Liang, Z.-P., & Sutton, B. (2015). “A real-time MRI investigation of the role of lingual and pharyngeal articulation in the production of the nasal vowel system of French.” *Journal of Phonetics*, 50, 34–51.

- Fu, M., Zhao, B., Carignan, C., Shosted, R., Perry, J., Kuehn, D., Liang, Z.-P., & Sutton, B. (2015). “High-resolution dynamic speech imaging with joint low-rank and sparsity constraints.” *Magnetic Resonance in Medicine*, 73(5), 1820–1832.
- Carignan, C. (2014). “An acoustic and articulatory examination of the ‘oral’ in ‘nasal’: The oral articulations of French nasal vowels are not arbitrary.” *Journal of Phonetics*, 46, 23–33.
- Shosted, R., Carignan, C., & Rong, P. (2012). “Managing the distinctiveness of phonemic nasal vowels: Articulatory evidence from Hindi.” *Journal of the Acoustical Society of America*, 131(1), 455–465.
- Carignan, C., Shosted, R., Shih, C., & Rong, P. (2011). “Compensatory articulation in American English nasalized vowels.” *Journal of Phonetics*, 39, 668–682.

BOOK CHAPTERS

- Carignan, C., (*in press*). “An examination of oral articulation of vowel nasality in the light of the independent effects of nasalization on vowel quality.” *Studi AISV 4: Speech in the Natural Context*.
- Nicholas, J., Fagyal, Z., Carignan, C., & Shosted, R. (*in press*). “Intra- and inter-dialectal differences in the perception of French nasal vowels in Québec.” In *Romance Linguistics 2014: Selected Proceedings of the 44th Linguistic Symposium on Romance Languages (LSRL), London, Ontario, May 2014*, Amsterdam, Philadelphia: John Benjamins.
- Carignan, C., Mielke, J., & Dodsworth, R. (2016). “Temporal dynamics of /æ/ tensing in North American English.” In Côté, M.-H., Knooihuizen, R., & Nerbonne, J. (eds.), *The future of dialects: Selected papers from Methods in Dialectology XV* (Language Variation 1), 313–319, Berlin: Language Science Press.
- Carignan, C. & Fagyal, Z. (2010). “V-to-V assimilation in trisyllabic words in French: Evidence for gradience and locality.” In S. Colina, A. Olarrea, & A.M. Carvalho (eds.), *Romance Linguistics 2009: Selected papers from the 39th Linguistic Symposium on Romance Languages (LSRL), Tucson, Arizona, March 2009*, volume 315 of Current Issues in Linguistic Theory, 25–42, Amsterdam: John Benjamins.

BOOK REVIEWS

- Carignan, C. (2016). Review of *Coarticulation and Sound Change in Romance*, by Recasens, D. *Language Dynamics and Change*, 6(1), 157–161.

CONFERENCE PROCEEDINGS

- Frej, M. Y., Carignan, C., & Best, C. (2017). “Acoustics and articulation of medial versus final coronal stop gemination contrasts in Moroccan Arabic.” In *Proceedings from INTERSPEECH 2017*, 201–214.
- Ying, J., Carignan, C., Shaw, J., Proctor, M., Derrick, D., & Best, C. (2017). “Temporal dynamics of lateral channel formation in /l/: 3D EMA data from Australian English.” In *Proceedings from INTERSPEECH 2017*, 2978–2982.
- Blackwood Ximenes, A., Shaw, J., & Carignan, C. (2016). “Tongue positions corresponding to formant values in Australian English vowels.” In Carignan, C., & Tyler, M. (eds.), *Proceedings of the 16th Australasian International Conference on Speech Science and Technology*, 109–112, Canberra: ASSTA.
- Carignan, C., Shosted, R., Fu, M., Liang, Z.-P., & Sutton, B. (2013). “The role of the tongue and pharynx in enhancement of vowel nasalization: A real-time MRI investigation of French nasal vowels.” In *Proceedings from INTERSPEECH 2013*, 3042–3046.
- Carignan, C. (2012). “Quand nasal est plus que nasal: L’articulation orale des voyelles nasales en français.” In *Actes de la conférence conjointe JEP-TALN-RECITAL 2012, volume 1: JEP*, 747–754.
- Carignan, C. (2011). “Oral articulation of nasal vowels in French.” In W.-S. Lee and E. Zee (eds.), *Proceedings of the International Congress of Phonetic Sciences XVII*, 408–411, Hong Kong: City University of Hong Kong.

- Carignan, C. (2011). “French nasal vowels: Motor equivalence in vowel dispersion.” In D. Ostry, S. R. Baum, L. Ménard, & Vincent L. Gracco (eds.), *Proceedings of the 9th International Seminar on Speech Production*, 265–272, Montréal: UQÀM.
- Rong, P., Shosted, R., & Carignan, C. (2011). “The relationship between velopharyngeal opening and place of articulation: An aerodynamic and EPG investigation.” In D. Ostry, S. R. Baum, L. Ménard, & Vincent L. Gracco (eds.), *Proceedings of the 9th International Seminar on Speech Production*, 281–288, Montréal: UQÀM.
- Shosted, R., Carignan, C., & Rong, P. (2011). “Estimating vertical larynx position with EMA.” In D. Ostry, S. R. Baum, L. Ménard, & Vincent L. Gracco (eds.), *Proceedings of the 9th International Seminar on Speech Production*, 139–146, Montréal: UQÀM.

PRESENTATIONS

INVITED TALKS

- Carignan, C. (*Don't mind the gap! Building bridges between articulation, acoustics, and perception of speech*, Speech, Hearing and Phonetic Sciences, University College London, UK, May 2019.
- Egurtzegi, A. & Carignan, C. *A case of perceptual reanalysis: The ongoing merger of /h/ and /ħ/ in Mixean Basque*, ‘Whither reanalysis?’, Humboldt University Berlin, Germany, February 2019.
- Mailhammer, R., Carignan, C., & Sherwood, S. *The puzzle of Middle English <au> before nasals: nasalised vowel, diphthong or both?*, Institut für Englische Philologie Oberseminar ‘Diachrone Linguistik und anglistische Mediävistik’, LMU Munich, Germany, January 2019.
- Carignan, C. *Using naïve listener imitations of native speaker productions to investigate mechanisms of listener-based sound change*, Laboratoire Parole et Langage (LPL), Aix Marseille Université, Aix-en-Provence, France, November 2018.
- Carignan, C. *A cross-linguistic examination of vowel nasality in the light of the psycho-acoustic pressure on the vowel space due to velum lowering, a.k.a., “The naturalness of the French counter-clockwise nasal vowel chain shift”*, Oberseminar Romanistische Linguistik, Institute of Romance Philology, LMU Munich, Germany, May 2018.
- Carignan, C. *Using ultrasound and nasalance to investigate the independent effect of nasalization on the acoustic vowel space*, Phonology Seminar Series, Yale University, New Haven, Connecticut, United States, March 2018.
- Carignan, C. “*A nose by any other name would sound as sweet*”: *The tale of nasalization, misperception, and sound change*, MAMPF: Moderne Ansätze und Methoden der Phonetischen Forschung, Institute of Phonetics and Speech Processing, Munich, Germany, December 2017.
- Carignan, C. *New horizons in exploring human speech production: The possibilities of articulatory research*, EMA delegation to Southwestern University of Finance and Economics, Chengdu, China, May 2017.
- Carignan, C. *Thinking outside the nose: Articulatory covariation in the realization of F1 of Southern French nasal vowels*, Linguistics Research Seminar, Macquarie University, Sydney, Australia, February 2017.
- Carignan, C. *Articulatory co-variation in Southern French nasal vowels: Towards recreating sound change in the laboratory*, University of Melbourne, Melbourne, Australia, May 2016.
- Kember, H., Carignan, C., & Kalashnikova, M. *Love at first sound: Can the way the Bachelorette talks predict who will win her heart?*, CoEDL Fest 2016, Western Sydney University, Sydney, Australia, February 2016.
- Carignan, C. *Vowel nasalisation as a litmus test for sound change research*, Department of Language and Linguistics Seminar Series, La Trobe University, Melbourne, Australia, November 2015.
- Carignan, C. *Decoding the gradient: What can articulatory research teach us about language?*, Translation, Interpreting, Languages and Linguistics Seminar Series, Western Sydney University, Sydney, Australia, October 2015.
- Carignan, C. *An oral articulatory approach to vowel nasalization: Searching for the “oral” in “nasal”*, Monday Evening Research Colloquium (MERC) series, The MARCS Institute – University of Western Sydney, Sydney, Australia, January 2015.

- Carignan, C. *Letting your nose guide you: Researching the “oral” of [nasal]*, University of Ottawa, Ottawa, Canada, January 2015.
- Carignan, C. *An oral articulatory approach to vowel nasalization: Searching for the “oral” in “nasal”*, McGill University, Montreal, Canada, January 2015.
- Carignan, C., Shosted, R., Fu, M., Liang, Z.-P., & Sutton, B. *Lingual and pharyngeal enhancement of vowel nasalization in French: A real-time MRI application of ThArea and DIPCA*, NCLLP Brownbag Series, North Carolina State University, North Carolina, United States September 2013.
- Carignan, C. *When nasal is more than nasal: Oral articulation in vowel nasalization*, Linguistics Department Colloquium, University of California – Berkeley, California, United States, January 2013.
- Carignan, C. *Articulation orale des voyelles nasales en français*, GIPSA-lab, Université Stendhal-Grenoble 3, Grenoble, France, October 2011.

CONFERENCE PRESENTATIONS

- Carignan, C., Hoole, P., Kunay, E., Joseph, A., Voit, D., Frahm, J., Harrington, J., *Steps of phonological vowel nasality: Evidence from real-time MRI velum movement in German*, Seminar in phonetics and phonology: Speech variation, language change, and computational modelling, Venice, Italy, May 2019.
- Carignan, C., Sherwood, S., & Mailhammer, R. *The phonetics of Middle English <au> before nasals: diphthong or nasalized monophthong?*, The Eleventh International Conference on Middle English (ICOME 11), Florence, Italy, February 2019.
- Carignan, C., Shaw, J.A., Agostini, T., Mailhammer, R., Harvey, M., & Derrick, D. *A temporal ultrasound study of lenition in Iwaidja*, Linguistic Society of America Annual Meeting, New York City, NY, January 2019.
- Carignan, C. *Using naïve imitation to investigate listener-based sound change*, LabPhon16, Lisbon, Portugal, June 2018.
- Carignan, C., Hoole, P., Kunay, E., Pouplier, M., Harrington, J., & Frahm, J. *Using functional linear mixed models and generalized additive mixed models to identify spatial regions of vocal tract variation*, LabPhon16 satellite event: “New Developments in Speech Sensing and Imaging”, Lisbon, Portugal, June 2018.
- Carignan, C. *The linguistic time machine: Towards recreating sound change in the laboratory*, Workshop on the Regularity Principle in Sound Change, Universität zu Köln, Cologne, Germany, July 2017.
- Carignan, C. *Gradiency in (mis)perception of articulatory co-variation: Naïve listener imitations of native articulatory strategies*, 3rd International Workshop on Dynamic Modeling, Universität zu Köln, Cologne, Germany, July 2017.
- Kember, H., Carignan, C., & Kalashnikova, M., *Love at first sound: Can the way the Bachelorette speaks predict who will win her heart?*, Experimental Psychology Conference 2016, Melbourne, Australia, April 2016.
- Carignan, C. & Mielke, J. *Multivariate analysis of articulatory-acoustic relationship in Southern American English vowels*, 46th annual conference of the Australian Linguistic Society, Parramatta, Australia, December 2015.
- Mielke, J., Thomas, E. R., & Carignan, C. *Using ultrasound articulatory signals to investigate the phonetic motivations of English /æ/ tensing*, 170th Meeting of the Acoustical Society of America, Jacksonville, FL, November 2015.
- Carignan, C., Mielke, J., & Dodsworth, R. *Temporal dynamics of /æ/ tensing in North American English: An ultrasound study*, Methods in Dialectology XV, Groningen, the Netherlands, August 2014.
- Mielke, J., Carignan, C., & Dodsworth, R.. *A study of tongue trajectories for English /æ/ using articulatory signals automatically extracted from lingual ultrasound video*, 168th Meeting of the Acoustical Society of America, Indianapolis, IN, October 2014.
- Mielke, J. & Carignan, C. *Ultrasound + corpus study of phonetically-motivated North American French and English*, Ultrafest VI, Edinburgh, Scotland, November 2013.

- Carignan, C., Shosted, R., Fu, M., Liang, Z.-P., & Sutton, B. *The role of the tongue and pharynx in enhancement of vowel nasalization: A real-time MRI investigation of French nasal vowels*, INTERSPEECH 2013, Lyon, France, August 2013.
- Carignan, C. *Oral articulation of nasal vowels in French*, International Congress of Phonetic Sciences (ICPhS) XVII, Hong Kong, China, August 2011.
- Carignan, C. *Oral articulation of French nasal vowels*, Speech Production Workshop, Beckman Institute for Advanced Science and Technology, Urbana, IL, May 2011.
- Carignan, C., Shosted, R., Shih, C., & Rong, P. *Lingual response to vowel nasalization*, Conference on Phonetic Universals, Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany, October 2010.
- Carignan, C., Shosted, R., Shih, C., & Rong, P. *Oral co-articulatory response to vowel nasalization*, UIUC Linguistics Colloquium, Urbana, IL, September 2010.
- Carignan, C., Shosted, R., Shih, C., & Rong, P. *Lingual co-articulation of nasalized vowels in American English*, Illinois Speech Day, Toyota Technological Institute, Chicago, IL, May 2010.
- Carignan, C. & Fagyal, Z. *Vowel harmony more like umlaut? V-to-V assimilation in trisyllabic words in French*, 39th Linguistic Symposium on Romance Linguistics (LSRL), Tucson, AZ, March 2009.

POSTER PRESENTATIONS

- Carignan, C., Hoole, P., Kunay, E., Harrington, J., Pouplier, M., Joseph, A., & Frahm, J. *Examining the temporal extent of co-articulatory nasalization in German using real-time MRI*, Phonetik und Phonologie im deutschsprachigen Raum (P&P) 2018, Vienna, Austria, September 2018.
- Barlaz, M., Shosted, R., Carignan, C., Fu, M., Liang, Z.-P., & Sutton, B. *Understanding the relation between acoustics and articulation of nasal and oral vowels*, 5th Joint Meeting of the Acoustical Society of America and the Acoustical Society of Japan, Honolulu, HI, November 2016.
- Carignan, C. *Thinking outside the nose: Using simultaneous ultrasound, EGG, nasalance, and acoustic data to study distinctive and gradient vowel nasality*, MARCS Research Poster Day, Milperra, NSW, Australia, September 2016.
- Kalashnikova, M., Carignan, C., & Burnham, D. *What do mothers do when they hyper-articulate vowels in infant directed speech?*, MARCS Research Poster Day, Milperra, NSW, Australia, September 2016.
- Barlaz, M., Shosted, R., Carignan, C., Fu, M., Liang, Z.-P., & Sutton, B. *Deformation-based articulatory representations of speech sounds*, LabPhon15, Cornell University, Ithaca, NY, July 2016.
- Mielke, J., Carignan, C., & Thomas, E. *Production dynamics and phonetic motivations for English raised /æ/ and intrusive [l]*, LabPhon15, Cornell University, Ithaca, NY, July 2016.
- Ying, J., Shaw, J., Best, C., Proctor, M., Derrick, D., & Carignan, C. *Articulation and Representation of Laterals in Australian-accented English*, LabPhon15, Cornell University, Ithaca, NY, July 2016.
- Carignan, C. *Quand nasal est plus que nasal: L'articulation orale des voyelles nasales en français*, 29^{emes} Journées d'Etudes sur la Parole (JEP 2012), Grenoble, France, June 2012.
- Carignan, C. *French nasal vowels: Motor equivalence in vowel dispersion*, 9th International Seminar on Speech Production (ISSP), Montreal, Canada, June 2011.
- Rong, P., Shosted, R., & Carignan, C. *The relationship between velopharyngeal opening and place of articulation: An aerodynamic and EPG investigation*, 9th International Seminar on Speech Production (ISSP), Montreal, Canada, June 2011.
- Shosted, R., Carignan, C., & Rong, P. *Estimating vertical larynx position using EMA*, 9th International Seminar on Speech Production (ISSP), Montreal, Canada, June 2011.
- Carignan, C. *Acquisition of phonemic velic gestures by L2 learners: A case of French nasal vowel perception and production by English speakers*, Second Annual SLATE Graduate Research Symposium, Urbana, IL, May 2010.

FUNDING & AWARDS

Achievement Award in Recognition of Exemplary Service, The MARCS Institute for Brain, Behaviour and Development, 2016.

Capital Equipment Bid, The MARCS Institute for Brain, Behaviour and Development, “EchoB compact external ultrasound system”, Investigator: Christopher Carignan, \$15 965 AUD, 2016.

Transdisciplinary and Innovation Grant, Australian Research Council Centre of Excellence for the Dynamics of Language, “Deciphering the great and mysterious singing machine”, Investigators: Christopher Carignan, Catherine Best; Collaborator: Rebecca Scott, \$8 000 AUD, 2016.

Language Documentation Grant, Australian Research Council Centre of Excellence for the Dynamics of Language, “A field manual for ultrasound research”, Investigator: Robert Mailhammer; Collaborators: Mark Harvey, Jason Shaw, Tonya Agostini, Christopher Carignan, Donald Derrick, \$9 581 AUD, 2016.

National Science Foundation Graduate Research Improvement Grant (1121780), “Doctoral Dissertation Research: Oral articulation of French nasal vowels.” PI: Ryan Shosted; Co-PIs: Christopher Carignan, Zsuzsanna Fagyal, \$12 000 USD, 2011–2013.

University of Illinois Graduate College Dissertation Completion Fellowship, “Oral Articulation of French Nasal Vowels.”, \$20 000 USD, 2012–2013.

Speech Production Research Education Initiative (SPREI) grant, UIUC, \$1 000 USD, 2010–2011.

TEACHING

STUDENT SUPERVISION

Blackwood Ximenes, Arwen, “The relation between acoustic and articulatory variation in vowels.” Degree: Masters of Philosophy. Primary supervisor: Carignan, C.; Secondary supervisor: Jason Shaw. 2016–2017.

Frej, Yassine, “The production and perception of peripheral geminate/singleton coronal contrasts in Arabic.” Degree: PhD. Supervisor: Best, C.; Panel members: Carignan, C., Tyler, M. 2016–2017.

Kulasekaran, Harsha, “Identifying acoustic and linguistic indicators of romantic attraction in the voice.” Western Sydney Undergraduate Summer Research Program. Primary supervisor: Carignan, C.; Secondary supervisor: Kember, H. 2016.

Marczak, Mitchell, “The science in the art of the articulation of song.” Western Sydney Undergraduate Summer Research Program. Primary supervisor: Best, C.; Secondary supervisor: Carignan, C. 2016.

Ying, Jia, “Articulation of laterals in Australian-accented English and Lebanese-accented English.” Degree: PhD. Supervisor: Carignan, C.; Panel members: Best, C., Derrick, D., Proctor, M., Shaw, J. 2016.

Badavi, Tamara, & Okan, Ceylan, “Phonetic convergence in housemates.” Masters of Research unit project. Supervisors: Kember, H., Carignan, C., & Kalashnikova, M. 2016.

Sedighi, Hamid, “Tongue shape differences in speech vs. singing of back vowels and their acoustic effects.” Masters of Research unit project. Primary supervisor: Carignan, C.; Secondary supervisor: Best, C. 2016.

Richardson, Alicia, “Articulatory differences between vowels in spoken vs. sung speech.” Western Sydney Undergraduate Summer Research Program. Primary supervisor: Carignan, C.; Secondary supervisor: Best, C. 2015.

WORKSHOPS

Carignan, C. *Quantifying the vocal tract: A primer to articulatory data analysis in R*, Laboratoire Parole et Langage (LPL), Aix Marseille Université, Aix-en-Provence, France, November 2018.

Carignan, C. & Stoakes, H. *Laboratory methods for researching sound change and variability*, Causes of Language Change Symposium, Western Sydney University, November 2016.

Carignan, C. *An introduction to MATLAB: It's high time you get your variables assigned*, Student MMM, The MARCS Institute for Language, Brain and Behaviour, October 2016.

- Kember, H., Harry, B., Macritchie, J., Zelic, G., Kalashnikova, M., & Carignan, C. *Practical statistics for the behavioural sciences*, ARC Centre of Excellence for the Dynamics of Language, Western Sydney University, August 2016.
- Kidd, E., & Carignan, C. *Statistics for language research: An introduction to R*, 1st Summer School of the ARC Centre of Excellence for the Dynamics of Language, University of Sydney, December 2015.
- Carignan, C. *Ultrasound: SUPERSONIC speech research!*, workshop, tutorial, & consultancy series, University of Illinois, Urbana, IL, May 2015.
- Carignan, C. *Becoming a nerd: Making programming and script writing work for you and your research*, NCLLP Brownbag Series, North Carolina State University, September 2014.
- Carignan, C. *Articulatory phonetics methodologies*, Phonetics and Phonology Phorum, University of California – Berkeley, January 2013.

UNIVERSITY COURSES

LINGUISTICS	ENG210: <i>Introduction to Language and Linguistics</i>		
	LLI-2-017-001: <i>Phonetics: Exploring Human Speech Sounds</i>		
	MRES 800171: <i>Speech Production (Unit: Learning and Processing Human Language)</i>		
	SHCA 102042: <i>The Sound of Language (lecture, tutorial, and coordination)</i>		
FRENCH	FR101: <i>Elementary French I</i>	ENGLISH	L.1: <i>Business English</i>
	FR102: <i>Elementary French II</i>		L.2: <i>Comprehension-Expression</i>
	FR104: <i>Intermediate French II</i>		L.2: <i>Comprehension-Synthesis</i>
	FR106: <i>French Active Review II</i>		L.1–3, M.1: <i>Oral Expression</i>
	FR213: <i>French Phonetics</i>		L.1–2: <i>Pronunciation</i>
	FR500: <i>Beginning French for Grads</i>		L.2: <i>Translation</i>

PROFESSIONAL ACTIVITIES AND SERVICE

CONFERENCE AND SESSION ORGANIZATION

- Carignan, C., & Tyler, M., Editors: *Proceedings of the 16th Australasian International Conference on Speech Science and Technology*, Canberra: The Australasian Speech Science & Technology Association, Inc. ISSN 2207-1296.
- Technical Program Committee Chair, *SST 2016: 16th Australasian International Conference on Speech Science and Technology*, Western Sydney University, Sydney, Australia, December 2016.
- Session chair, Australian Linguistic Society 2015, Parramatta, Australia, December 2015.
- Discussant, *Instrumental articulatory phonetics and dialectological fieldwork. Strange bedfellows?*, Methods in Dialectology XV, Groningen, the Netherlands, August 2014.
- Special session co-convenor, *New trends in vowel nasalization: The articulation of nasal vowels*. INTERSPEECH 2012, Portland, OR, September 2012.

ACADEMIC SERVICE

ACADEMIC COMMITTEES

Events and Outreach Committee, Association of Laboratory Phonology (ALP), 2018–present.

EXTERNAL SUPERVISORY BOARD MEMBER

PhD Confirmation of Candidature: Jessica Bazouni, School of Social Sciences and Psychology, Western Sydney University, January 2017.

DEPARTMENTAL SERVICE

- Speech Production topic coordinator, Masters of Research (MRes): Learning and Processing Human Language, The MARCS Institute, 2016.
- Monday Evening Research Colloquium (MERC) co-convenor, Speech and Language representative, The MARCS Institute, 2015–2017.
- Faculty Representative, Graduate Students of French, UIUC, 2012–2013.
- Graduate Student Grievance Committee: Graduate Students of French, UIUC, 2012–2013.

AD HOC REVIEW

JOURNALS

Computer Speech & Language; Folia Phoniatica et Logopaedica; International Journal of the Linguistic Association of the Southwest; International Journal of Speech-Language Pathology; Journal of the Acoustical Society of America; JASA Express Letters; Journal on Audio, Speech, and Music Processing; Journal of French Language Studies; Journal of the International Phonetic Association; Journal of Phonetics; Journal of Speech, Language, and Hearing Research; Laboratory Phonology; Language Documentation & Conservation; Language Dynamics and Change; Language and Speech; Phonetica; Research in Language; Speech Communication

CONFERENCES

International Seminar on Speech Production, INTERSPEECH

GRANT AWARDING BODIES

Fonds québécois de la recherche sur la société et la culture (FQRSC), National Science Foundation (NSF)

PUBLIC TALKS AND LECTURES

- Carignan, C. *See how you speak! Using ultrasound to research tongue movement*, Research Demonstration: MARCS Institute for Brain, Behaviour and Development.
- Carignan, C. *Phonetics: Exploring the world of human speech sounds*, Encore lecture series: Osher Lifelong Learning Institute, Raleigh, NC, April 2015.
- Carignan, C. *The science of speech: A look inside your body as you talk*, Science-Go-Round event, Joyner Elementary School, Raleigh, NC, November 2014.
- Carignan, C. *Science Cafe: The Science of Language and Speech*, North Carolina Museum of Natural Sciences, Raleigh, NC, July 2014.