

Carlos Busso

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RESEARCH INTERESTS	His research interest is in human-centered multimodal machine intelligence and applications. His current research includes the broad areas of speech processing, affective computing, multimodal human-machine interfaces, in-vehicle active safety systems, and machine learning methods for multimodal processing. His work has direct implications in many practical domains, including national security, health care, entertainment, transportation systems, and education.
EDUCATION	<p>University of Southern California, Los Angeles, CA 2003-2008 Ph.D. in Electrical Engineering Advisor: Shrikanth Narayanan <i>Niki & C. L. Max Nikias Chair in Engineering</i> <i>Thesis:</i> “Multimodal Analysis of Expressive Human Communication: Speech and gesture interplay”</p> <p>University of Chile, Santiago, Chile 2001-2003 Master of Science in Electrical Engineering Advisor: Néstor Becerra Yoma <i>Thesis:</i> “Speech transmission over IP with a protocol based on the LMS algorithm” (Spanish)</p> <p>University of Chile, Santiago, Chile 1996-2003 Electrical Engineer</p> <p>University of Chile, Santiago, Chile 1996-2000 Bachelor in Electrical Engineering</p>
PROFESSIONAL EXPERIENCE	<p>Carnegie Mellon University, Pittsburgh, PA, USA Language Technologies Institute Professor 2025-present Director of the Multimodal Speech Processing (MSP) lab [https://lab-msp.com]</p> <p>University of Texas at Dallas, Richardson, TX, USA Department of Electrical and Computer Engineering Professor 2020-2024 Associate Professor 2015-2020 Assistant Professor 2009-2015 Director of the Multimodal Signal Processing (MSP) lab [msp.utdallas.edu]</p> <p>University of Southern California, Los Angeles, CA, USA Postdoctoral Research Associate 2008-2009 Mentor: Shrikanth Narayanan Analysis of expressive human communication</p> <p>Motorola, Austin, TX, USA Summer Intern Summer 2001 Mentor: Kate Stewart Optimized and modified C code (project Media Stream Resource Module)</p> <p>Telefónica Móvil, Santiago, Chile Summer Intern Summer 2000 Mentor: Andres Guerra Analyzed and tested quality of service in wireless communication network</p> <p>Adexus S.A., Santiago, Chile Summer Intern Summer 1999 Mentor: Aurelio Luco Reported quality of service in optical communication networks</p>

HONORS, AWARDS AND FELLOWSHIPS	Fellow of the International Speech Communication Association (ISCA)	2024	
	Jonsson School Faculty Research Award, Full Professor	2024	
	Federal Research Innovation and Expenditures DynamE (FRIEND) at UTD	2024	
	AAAC Student Dissertation Award (student: Wei Cheng (Winston) Lin)	2024	
	Fellow of the Institute of Electrical and Electronics Engineers (IEEE)	2023	
	ACM ICMI Community Service Award	2023	
	SIPI Distinguished Alumni Award in the Mid-Career/Academia category	2023	
	Federal Research Innovation and Expenditures DynamE (FRIEND) at UTD	2023	
	2021 Best Paper Award from IEEE Transactions on Affective Computing	2022	
	Best of IEEE Transactions on Affective Computing Paper Collection award	2021	
	Best Paper Award – AAAC Affective Computing and Intelligent Interaction (ACII)	2017	
	Recognition of Service Award from ACM	2016	
	Outstanding Reviewer for Visual Communications and Image Processing (VCIP)	2016	
	Jonsson School Senior (Assoc. Professor) Research Award	2016	
	IEEE Access Best Multimedia Contest Winner 2015	2015	
	NSF CAREER award	2015	
	Third prize IEEE ITSS Best Dissertation Award 2015 (student: Nanxiang Li)	2015	
	ICMI Ten-Year Technical Impact Award – International conference on multimodal interaction (ICMI)	2014	
	Quality Reviewer – IEEE International Conference on Multimedia and Expo (ICME)	2013	
	Recognition for Excellence in Reviewing – IEEE Conference on Automatic Face and Gesture Recognition (FG)	2013	
	Best Paper Award – IEEE International Conference on Multimedia and Expo (ICME)	2011	
	Quality Reviewer – IEEE International Conference on Multimedia and Expo (ICME)	2011	
	First place, Classifier Sub-Challenge event at the Interspeech 2009 emotion challenge	2009	
	Fellowship in Digital Scholarship, University of Southern California, Los Angeles, CA	2007-2008	
	Provost’s Fellowship, University of Southern California, Los Angeles, CA	2003-2005	
	Selected the best Electrical Engineer graduated in Chile by the Chilean School of Engineering	2003	
	PROFESSIONAL MEMBERSHIPS	International Speech Communication Association (ISCA)	
		Institute of Electrical and Electronics Engineers (IEEE)	
		- IEEE Signal Processing Society	
		- IEEE Computer Society	
- IEEE Intelligent Transportation Systems Society			
Senior Member of the Association for Computing Machinery (ACM)			
Member of the Association for the Advancement of Affective Computing (AAAC)			
MOST RELEVANT PROFESSIONAL ACTIVITIES	★ Senior Area Editor of IEEE/ACM Speech and Language Processing (Jan.2025-present)		
	★ Member of the IEEE Speech and Language Processing Technical Committee (2025-2027)		
	★ Associated Editor of IEEE Transactions on Affective Computing (Mar.2020-Dec.2024)		
	★ Senior editor of IEEE Signal Processing Letters (Aug. 2018-Jul. 2022)		
	★ Associated Editor of IEEE/ACM Transaction on Audio, Speech, and Language(Mar.2016-Mar.2020)		

- ★ Chair of the Steering Committee of ICMI (Jan. 2025-present)
- ★ Member of the Steering Committee of ICMI (Feb. 2020-present)
- ★ General Co-Chair of Interspeech 2028
- ★ Program Chair of Interspeech 2026
- ★ Blue Sky Paper Chair of ACM ICMI 2023
- ★ Publication Chair of ACM ICMI 2022
- ★ General Chair of ACM ICMI 2021
- ★ Program Chair of IEEE Automatic Speech Recognition and Understanding Workshop (ASRU2021)
- ★ Workshops/Tutorials Chair of FG 2020
- ★ Workshop Chairs of ACM ICMI 2019
- ★ Publication Chair of AAAC ACII 2019
- ★ Organizer of International Workshop on Human Behavior Understanding (HBU 2018)
- ★ General Chair of AAAC ACII 2017
- ★ Program Chair of VCIP 2017
- ★ Workshops/Tutorials Chair of FG 2017
- ★ Vice Chair of the IEEE-Dallas Chapter of SPS
- ★ Program Chair of ACM ICMI 2016
- ★ Publicity Chair of Interspeech 2016
- ★ Doctoral Spotlight Chair of ACM ICMI 2015
- ★ Workshop Chair of AAAC ACII 2015
- ★ Doctoral Consortium Chair of IEEE FG 2015
- ★ Publicity Chair of IEEE ICME 2014
- ★ Workshop Chair of ACM ICMI 2014
- ★ Doctoral Spotlight Chair of ACM ICMI 2013
- ★ Demonstrations and Retrieval Challenges Competition Chairs of ACM ICMR 2013
- ★ Doctoral Spotlight Chair of ACM ICMI 2012
- ★ NSF review panel (CISE) (2011, 2013, 2015, 2016, 2017, 2018, 2019, 2020, 2023)
- ★ Meta Reviewer/Area Chair
 - ICASSP 2023, 2024, 2025
 - IEEE FG 2015, 2024
 - Interspeech 2015, 2016, 2019, 2025
 - ACM ICMI 2015, 2018, 2024
- ★ Technical/Program Committee
 - Generation and Evaluation of Non-verbal Behaviour for Embodied Agents (GENEA 2023)
 - International Workshop on Speech, Music, and Mind (SMM 2023)
 - Generation and Evaluation of Non-verbal Behaviour for Embodied Agents (GENEA 2022)
 - International Workshop on Human Behavior Understanding (HBU 2022)
 - Multimodal Sentiment Analysis in Real-life Media Challenge and Workshop (MuSe 2021)
 - International Workshop on Human Behavior Understanding (HBU 2021)
 - Generation and Evaluation of Non-verbal Behaviour for Embodied Agents (GENEA 2020)

- Multimodal Sentiment Analysis in Real-life Media Challenge and Workshop (MuSe 2020)
- Multimodal Analyses enabling Artificial Agents in Human-Machine Interaction (MA3HMI 2018)
- Emotion Recognition in the Wild (EmotiW) Challenge at ACM ICMI 2018.
- Speech, Music and Mind: Detecting and Influencing Mental States with Audio (2018)
- Affective Content Analysis (AffCon2018) at AAAI-2018
- Automatic affect analysis and synthesis at ICIAP 2017
- Fifth Emotion Recognition in the Wild (EmotiW) challenge at ACM ICMI 2017.
- Deep Affective Learning and Context Modeling (DAL-COM 2017)
- International Workshop on Context Based Affect Recognition (CBAR 2016)
- NIPS workshop on Multimodal Machine Learning 2015
- Third Emotion Recognition in the Wild (EmotiW) Challenge at ACM ICMI 2015.
- Second Workshop on Computer Vision for Affective Computing (CV4AC) at ICCV 2015.
- ICME 2015
- The 3rd International Workshop on Context Based Affect Recognition (CBAR 2015)
- The 3rd International Workshop on Emotion Representation, Analysis and Synthesis in Continuous Time and Space (EmoSPACE 2015)
- ICME 2014
- ACM Multimedia 2014
- International Conference on Computational Linguistics (COLING 2014)
- Inter. Workshop on Emotion, Social Signals, Sentiment & Linked open data (ES³LOD 2014)
- ICME 2013
- International Workshop on Human Behavior Understanding (HBU 2013)
- International Workshop on Emotion Representations and Modelling for Human-Computer Interaction Systems (ERM4HCI 2013)
- The 6th Biennial Workshop on Digital Signal Processing for In-Vehicle Systems, 2013
- First Emotion Recognition In The Wild Challenge (EmotiW 2013)
- 5th International Workshop on Affective Interaction in Natural Environments (AFFINE 2013): Interacting with Affective Artefacts in the Wild
- 2nd International Workshop on Context Based Affect Recognition (CBAR 2013)
- EmoSPACE Workshop at FG 2013
- 10th IEEE International Conference on Automatic Face and Gesture Recognition (FG 2013)
- 1st International Workshop on Context Based Affect Recognition (CBAR 2012), (SocialCom12)
- Workshop What’s in a Face?, European Conference on Computer Vision (ECCV 2012)
- 4th International Workshop on Corpora for Research on Emotion Sentiment & Social Signals (ES3 2012)
- Digital Signal Processing Workshop for In-Vehicle Systems, 2011.
- Machine Learning for Affective Computing (MLAC), 2011.
- Inferring cognitive and emotional states from multimodal behavioural measures, 2011.

SERVICE AT THE
UNIVERSITY OF
TEXAS AT DALLAS

Member of the EE Faculty Search Committee	2021 - present
Member of the UTD Advisory Committee on Research	2021 - 2023
Assigned by UTD as a mentor of junior faculty	2022-present
Member of the UTD Library Committee	2020 - 2022
Chair of the Ph.D. Program Committee	2020 - 2021
Member of the Ph.D. Program Committee	2019 - 2020
Chair of the Electrical Engineering Educational Assessment Committee	2018-2019
Member of the Electrical Engineering Educational Assessment Committee	2015-2018
Member of the Electrical Engineering TA Assignment Committee	2012-2015
Member of the Electrical Engineering Teaching Lab Committee	2014-2015
Member of the Electrical Engineering Faculty Search	2012-2013
Member of the Electrical Engineering Graduate Committee	2009-2012
Member of the PhD committee for 84 students	2009-present
Ad-Hoc Committee Reappointment/Tenure/Promotion	
★ Member of Ad-Hoc committee for Tenure and Promotion to Associate Professor for a colleague (2024-2025)	
★ Member of Ad-Hoc committee for the Mid-Probationary review for a colleague (2021-2022)	
★ Member of the Ad-Hoc committee for the promotion to Professor for a colleague (2020-2021)	
★ Chair of the Ad-Hoc committee for the promotion to Senior Lecture level II of a colleague (2019-2020)	
★ Chair of Ad-Hoc committee for the Mid-Probationary review for a colleague (2018-2019)	
★ Member of Ad-Hoc committee for the Mid-Probationary review for a colleague (2017-2018)	
★ Member of Ad-Hoc committee for the Mid-Probationary review for a colleague (2016-2017)	

PUBLICATIONS

Note: Current/former mentees are highlighted in italics.

Journal Articles

- [1] C.-S. Ahn, R. Rana, C. Busso, and J.C. Rajapakse, "Multitask transformer for cross-corpus speech emotion recognition," *IEEE Transactions on Affective Computing*, vol. Early Access, 2025. DOI: 10.1109/TAFFC.2025.3526592.
- [2] S. G. Upadhyay, *L. Martinez-Lucas*, W. Katz, C. Busso, and C.-C. Lee, "Phonetically-anchored domain adaptation for cross-lingual speech emotion recognition," *IEEE Transactions on Affective Computing*, vol. Early Access, 2025. DOI: 10.1109/TAFFC.2025.3530105.
- [3] *K. Rosero*, *A.N. Salman*, L. M. Harrison, A.A. Kane, C. Busso, and R.R. Hallac, "Deep learning-based assessment of lip symmetry for patients with repaired cleft lip," *The Cleft Palate Craniofacial Journal*, vol. Early Access, 2025, DOI: 10.1177/10556656241312730.
- [4] *A.N. Salman*, *K. Rosero*, *L. Goncalves*, and C. Busso, "Mixture of emotion dependent experts: Facial expressions recognition in videos through stacked expert models," *IEEE Open Journal of Signal Processing*, vol. Early Access, 2025. DOI: 10.1109/OJSP.2025.3530793.
- [5] W.-S. Chien, S.G. Upadhyay, *W.-C. Lin*, C. Busso, and C.-C. Lee, "Differential impacts of monologue and conversation on speech emotion recognition," *IEEE Transactions on Affective Computing*, vol. Early Access, 2025, DOI: 10.1109/TAFFC.2024.3509138
- [6] *L. Goncalves*, *S.-G. Leem*, *W.-C. Lin*, B. Sisman, and C. Busso, "Versatile audio-visual learning for emotion recognition," *IEEE Transactions on Affective Computing*, vol. Early Access, 2025. (arXiv:2305.07216) DOI: 10.1109/TAFFC.2024.3433386.
- [7] *H.-C. Chou*, *L. Goncalves*, *S.-G. Leem*, *A.N. Salman*, C.-C. Lee, and C. Busso, "Minority views matter: Evaluating speech emotion classifiers with human subjective annotations by an all-inclusive aggregation rule," *IEEE Transactions on Affective Computing*, vol. Early Access, 2025. DOI: 10.1109/TAFFC.2024.3411290.
- [8] A.P. Lenton-Brym, A. Collins, J. Lane, C. Busso, J. Ouyang, S. Fitzpatrick, J.R. Kuo, and C. M. Monson "Using machine learning to increase access to and engagement with trauma-focused

- interventions for posttraumatic stress disorder,” *British Journal of Clinical Psychology*, vol. 64, no. 1, pp. 123–136, March 2025, DOI: 10.1111/bjc.12468
- [9] *L. Goncalves, H.-C. Chou, A.N. Salman, C.-C Lee, and C. Busso*, “Jointly learning from unimodal and multimodal-rated labels in audio-visual emotion recognition,” *IEEE Open Journal of Signal Processing*, vol. 6, pp. 165–174, January 2025. DOI: 10.1109/OJSP.2025.3530274.
- [10] *N. Grágeda, C. Busso, E. Alvarado, R. García, R. Mahu, and N. Becerra Yoma*, “Speech emotion recognition in real static and dynamic human-robot interaction scenarios,” *Computer Speech and Language*, vol. 89, pp. 101666, January 2025, DOI: 10.1111/bjc.12468
- [11] *K. Caughlin, E. Duran-Sierra, S. Cheng, R. Cuenca, B. Ahmed, J. Ji, M. Martinez, M. Al-Khalil, H. Al-Enazi, J. Jo, and C. Busso*, “Contrastive clustering-based patient normalization to improve automated, in vivo oral cancer diagnosis from multispectral autofluorescence,” *Cancers*, vol. 16, no. 23, pp. 4120, December 2024, DOI: 10.3390/cancers16234120.
- [12] *W.-C. Lin, K. Sridhar, and C. Busso*, “An interpretable deep mutual information curriculum metric for a robust and generalized speech emotion recognition system,” *IEEE/ACM Transactions on Audio, Speech and Language Processing*, vol. 32, pp. 5117-5130, November 2024, DOI: 10.1109/TASLP.2024.3507562.
- [13] *T. Rajapakshe, R. Rana, S. Khalifa, B. Sisman, B.W. Schuller, and C. Busso*, “emoDARTS: Joint optimisation of CNN & sequential neural network architectures for superior speech emotion recognition,” *IEEE Access*, vol. 12, pp. 110492-110503, August 2024. (arXiv:2403.14083). DOI: 10.1109/ACCESS.2024.3439604
- [14] *L. Martinez-Lucas, W.-C. Lin, and C. Busso*, “Analyzing continuous-time and sentence-level annotations for speech emotion recognition,” *IEEE Transactions on Affective Computing*, vol. 15, no. 3, pp. 1754-1768, July-September 2024, DOI: 10.1109/TAFFC.2024.3372380
- [15] *E. Duran Sierra, S. Cheng, R. Cuenca, B. Ahmed, J. Ji, V. Yakovlev, M. Martinez, M. Al-Khalil, H. Al-Enazi, C. Busso, and J. A. Jo*, “Computer-assisted discrimination of cancerous and pre-cancerous from benign oral lesions based on multispectral autofluorescence imaging endoscopy,” *Biophotonics Discovery*, vol. 1, no. 2, pp. 025001, July-September 2024. DOI: 10.1117/1.BIOS.1.2.025001
- [16] *S.-G. Leem, D. Fulford, J.-P. Onnela, D. Gard, and C. Busso*, “Selective acoustic feature enhancement for speech emotion recognition with noisy speech,” *IEEE/ACM Transactions on Audio, Speech and Language Processing*, vol. 32, pp. 917-929, 2024, DOI: 10.1109/TASLP.2023.3340603.
- [17] *W.-C. Lin and C. Busso*, “Deep temporal clustering features for speech emotion recognition,” *Speech Communication*, vol. 157, pp. 103027, February 2024, DOI: 10.1016/j.specom.2023.103027
- [18] *A. Vidal and C. Busso*, “Multimodal attention for lip synthesis using conditional generative adversarial networks,” *Speech communication*, vol. 153, pp. 102959, September 2023, DOI: 10.1016/j.specom.2023.102959.
- [19] *W.-C. Lin and C. Busso*, “Chunk-level speech emotion recognition: A general framework of sequence-to-one dynamic temporal modeling,” *IEEE Transactions on Affective Computing*, vol. 14, no. 2, pp. 1215-1227, April-June 2023, DOI: 10.1109/TAFFC.2021.3083821
- [20] *J. Harvill, S.-G. Leem, M. Abdelwahab, R. Lotfian, and C. Busso*, “Quantifying emotional similarity in speech,” *IEEE Transactions on Affective Computing*, vol. 14, no. 2, pp. 1376-1390, April-June 2023, DOI: 10.1109/TAFFC.2021.3127390.
- [21] *Y. Qiu, T. Misu, and C. Busso*, “Unsupervised scalable multimodal driving anomaly detection,” *IEEE Transactions on Intelligent Vehicles*, vol. 8, no. 4, pp. 3154-3165, April 2023, DOI: 10.1109/TIV.2022.3160861.
- [22] *S. Jha, N. Al-Dhahir, and C. Busso*, “Driver visual attention estimation using head pose and eye appearance information,” *IEEE Open Journal of Intelligent Transportation System*, vol. 4, pp. 216-231, March 2023, DOI: 10.1109/OJITS.2023.3258184.
- [23] *W.-C. Lin and C. Busso*, “Sequential modeling by leveraging non-uniform distribution of speech emotion,” *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 31, pp. 1087-1099, February 2023, DOI: 10.1109/TASLP.2023.3244527.
- [24] *S. Jha and C. Busso*, “Estimation of driver’s gaze region from head position and orientation using probabilistic confidence regions,” *IEEE Transactions on Intelligent Vehicles*, vol. 8, no. 1, pp. 59-72, January 2023. (arXiv:2012.12754). DOI: 10.1109/TIV.2022.3141071.

- [25] *K. Caughlin*, E. Duran-Sierra, S. Cheng, R. Cuenca, B. Ahmed, J. Ji, M. Martinez, M. Al-Khalil, H. Al-Enazi, Y.-S. L. Cheng, J. Wright, J.A. Jo, and C. Busso, “Aligning small datasets using domain adversarial learning: Applications in automated in vivo oral cancer diagnosis,” *IEEE Journal of Biomedical and Health Informatics*, vol. 27, no. 1, January 2023, DOI: 10.1109/JBHI.2022.3217015.
- [26] *L. Goncalves* and C. Busso, “Robust audiovisual emotion recognition: Aligning modalities, capturing temporal information, and handling missing features,” *IEEE Transactions on Affective Computing*, vol. 13, no. 4, pp. 2156-2170, October-December 2022, DOI: 10.1109/TAFFC.2022.3216993.
- [27] *K. Sridhar* and C. Busso, “Unsupervised personalization of an emotion recognition system: The unique properties of the externalization of valence in speech,” *IEEE Transactions on Affective Computing*, vol. 13, no. 4, pp. 1959-1972, October-December 2022, DOI: 10.1109/TAFFC.2022.3187336.
- [28] *S. Jha*, M. Marzban, *T. Hu*, M.H. Mahmoud, N. Al-Dhahir, and C. Busso, “The multimodal driver monitoring database: A naturalistic corpus to study driver attention,” *IEEE Transactions on Intelligent Transportation Systems*, vol. 23, no. 8, pp. 10736-10752, August 2022. (arXiv:2101.04639). DOI: 10.1109/TITS.2021.3095462.
- [29] *T. Hu*, *S. Jha*, and C. Busso, “Temporal head pose estimation from point cloud in naturalistic driving conditions,” *IEEE Transactions on Intelligent Transportation Systems*, vol. 23, no. 7, pp. 8063-8076, July 2022, DOI: 10.1109/TITS.2021.3075350.
- [30] *A. Vidal*, *S. Jha*, S. Hassler, T. Price, and C. Busso, “Face detection and grimace scale prediction of white furred mice,” *Machine Learning with Applications*, vol. 8, pp. 100312, June 2022, DOI: 10.1016/j.mlwa.2022.100312.
- [31] *N. Sadoughi* and C. Busso, “Speech-driven expressive talking lips with conditional sequential generative adversarial networks,” *IEEE Transactions on Affective Computing*, vol. 12, no. 4, pp. 1031-1044, October-December 2021. (ArXiv: 1806.00154). DOI: 10.1109/TAFFC.2019.2916031.
- [32] *R. Lotfian* and C. Busso, “Over-sampling emotional speech data based on subjective evaluations provided by multiple individuals,” *IEEE Transactions on Affective Computing*, vol. 4, no. 12, pp. 870-882, October-December 2021, DOI: 10.1109/TAFFC.2019.2901465.
- [33] C.-C. Lee, *K. Sridhar*, J.-L. Li, *W.-C. Lin*, B.-H. Su, and C. Busso, “Deep Representation Learning for Affective Speech Signal Analysis and Processing: Preventing unwanted signal disparities,” *IEEE Signal Processing Magazine*, vol. 38, no. 6, pp. 22-38, November 2021, DOI: 10.1109/MSP.2021.3105939.
- [34] E. Duran-Sierra, S. Cheng, R. Cuenca, B. Ahmed, J. Ji, V. Yakovlev, M. Martinez, M. Al-Khalil, H. Al-Enazi, Y.S.L. Cheng, J. Wright, C. Busso, and J. Jo, “Machine-learning assisted discrimination of precancerous and cancerous from healthy oral tissue based on multispectral autofluorescence lifetime imaging endoscopy,” *Cancers*, vol. 13, no. 19, pp. 1-16, September 2021, DOI: 10.3390/cancers13194751.
- [35] K. N. Haque, R. Rana, J. Liu, J.H.L. Hansen, N. Cummins, C. Busso, and B. Schuller, “Guided generative adversarial neural network for representation learning and audio generation using fewer labelled audio data,” *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 29, pp. 2575-2590, July 2021, DOI: 10.1109/TASLP.2021.3098764.
- [36] D. Fulford, J. Mote, R. Gonzalez, S. Abplanalp, Y. Zhang, *J. Luckenbaugh*, J.-P. Onnela, C. Busso, and D. Gard, “Smartphone sensing of social interactions in people with and without schizophrenia,” *Journal of Psychiatric Research*, vol. 137, pp. 613-620, May 2021, DOI: 10.1016/j.jpsychires.2020.11.002.
- [37] *S. Parthasarathy* and C. Busso, “Predicting emotionally salient regions using qualitative agreement of deep neural network regressors,” *IEEE Transactions on Affective Computing*, vol. 12, no. 2, pp. 402-416, April-June 2021, DOI: 10.1109/TAFFC.2018.2878715.
- [38] G.N. Yannakakis, R. Cowie, and C. Busso, “The ordinal nature of emotions: An emerging approach,” *IEEE Transactions on Affective Computing*, vol. 12, no. 1, pp. 16-35, January-March 2021, DOI: 10.1109/TAFFC.2018.2879512. **Best Paper Award from IEEE Transactions on Affective Computing.**
- [39] *F. Tao* and C. Busso, “End-to-end audiovisual speech recognition system with multi-task learn-

- ing,” *IEEE Transactions on Multimedia*, vol. 23, pp. 1-11, January 2021, DOI: 10.1109/TMM.2020.2975922.
- [40] *S. Parthasarathy* and C. Busso, “Semi-supervised speech emotion recognition with ladder networks,” *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 28, pp. 2697-2709, September 2020. (ArXiv: 1905.02921). DOI: 10.1109/TASLP.2020.3023632.
- [41] *R. Lotfian* and C. Busso, “Building naturalistic emotionally balanced speech corpus by retrieving emotional speech from existing podcast recordings,” *IEEE Transactions on Affective Computing*, vol. 10, no. 4, pp. 471-483, October-December 2019, DOI: 10.1109/TAFFC.2017.2736999. **Best of IEEE Transactions on Affective Computing Paper Collection award.**
- [42] *A. Vidal*, J. Silva, and C. Busso, “Discriminative features for texture retrieval using wavelet packets,” *IEEE Access*, vol. 7, no. 1, pp. 148882-148896, December 2019, DOI: 10.1109/ACCESS.2019.2947006.
- [43] *R. Lotfian* and C. Busso, “Lexical dependent emotion detection using synthetic speech reference,” *IEEE Access*, vol. 7, no. 1, pp. 22071-22085, December 2019, DOI: 10.1109/ACCESS.2019.2898353.
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- [46] *R. Lotfian* and C. Busso, “Curriculum learning for speech emotion recognition from crowdsourced labels,” *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 27, no. 4, pp. 815-826, April 2019. (ArXiv: 1805.10339). DOI: 10.1109/TASLP.2019.2898816.
- [47] *M. Abdelwahab* and C. Busso, “Domain adversarial for acoustic emotion recognition,” *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 26, no. 12, pp. 2423-2435, December 2018. (ArXiv: 1804.07690). DOI: 10.1109/TASLP.2018.2867099.
- [48] *F. Tao* and C. Busso, “Gating neural network for large vocabulary audiovisual speech recognition,” *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 26, no. 7, pp. 1286-1298, July 2018, DOI: 10.1109/TASLP.2018.2815268.
- [49] *N. Li* and C. Busso, “Calibration free, user independent gaze estimation with tensor analysis,” *Image and Vision Computing*, vol. 74, pp. 10-20, June 2018, DOI: 10.1016/j.imavis.2018.04.001.
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- [51] J.H.L. Hansen, C. Busso, Y. Zheng, and A. Sathyanarayana, “Driver modeling for detection and assessment of driver distraction: Examples from the UTDrive test bed,” *IEEE Signal Processing Magazine*, vol. 34, no. 4, pp. 130-142, July 2017, DOI: 10.1109/MSP.2017.2699039.
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Book chapters

- [1] C. Pelachaud, C. Busso, and D. Heylen, "Multimodal behavior modeling for socially interactive agents," in The Handbook of Socially Interactive Agents: 20 Years of Research on Intelligent Virtual Agents, Embodied Conversational Agents, and Social Robotics, B. Lugrin, C. Pelachaud, and D. Traum, Eds., pp. 259-310. Association for Computing Machinery, Human-Centered Computing, New York, NY, USA, September 2021, DOI: 10.1145/3477322.3477331.
- [2] *S. Jha* and C. Busso, "Head pose as an indicator of drivers' visual attention," in Vehicles, Drivers, and Safety, H. Abut, J.H.L. Hansen, G. Schmidt, and K. Takeda, Eds., vol. 2 of Intelligent Vehicles and Transportation, pp. 113-132. De Gruyter, May 2020, DOI: 10.1515/9783110669787-008.
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Abstracts

- [1] *K. Rosero, A. N. Salman*, C. Busso, and R. Hallac, "A tailored machine learning approach for cleft lip symmetry analysis," in *The American Cleft Palate Craniofacial Association (ACPA 2024)*, Denver, CO, April 2024.
- [2] R. Cuenca, M. J. Serafino, G. P. Tortorelli, R. C. Faram, K.E. Higgins, S.S. Khajotia, Y.-S. L. Cheng, J. M. Plemons, V. Woo, C. Busso, *K.R. Caughlin*, and J.A. Jo, "Dual-excitation multispectral autofluorescence lifetime endoscopy for clinical label-free metabolic imaging of oral lesions," in *Imaging, Therapeutics, and Advanced Technology in Head and Neck Surgery and Otolaryngology 2023*, San Francisco, CA, USA, January-February 2023, vol. SPIE PC12354, pp. 12354-8, DOI: 10.1117/12.2647972.
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- [7] M. Bulut, S. Yildirim, S. Lee, C.M. Lee, C. Busso, A. Kazamzadeh, and S. Narayanan, "Emotion to emotion speech conversion in phoneme level," *Journal of the Acoustical Society of America*, vol. 116, pp. 2481, 2004, DOI: 10.1121/1.4784908.
- [8] S. Yildirim, M. Bulut, C. Busso, C.M. Lee, A. Kazamzadeh, S. Lee, and S. Narayanan, "Study of acoustic correlates associate with emotional speech," *Journal of the Acoustical Society of America*, vol. 116, pp. 2481, 2004, DOI: 10.1121/1.4784909.

ArXiv Papers

- [1] I. R. Ülgen, C. Busso, J.H.L. Hansen, and B. Sisman, "We need variations in speech synthesis: Sub-center modelling for speaker embeddings," *ArXiv e-prints (arXiv:2407.04291)*, pp. 1-5, July 2024, DOI: 10.48550/arXiv.2407.04291.
- [2] *S.-G. Leem*, D. Fulford, J.-P. Onnela, D. Gard, and C. Busso, "Describe where you are: Improving noise-robustness for speech emotion recognition with text description of the environment," *ArXiv e-prints (arXiv:2407.17716)*, pp. 1-14, July 2024, DOI: 10.48550/arXiv.2407.17716.
- [3] *Y. Qiu*, T. Misu, and C. Busso, "Driving anomaly detection using conditional generative adversarial network," *ArXiv e-prints (arXiv:2203.08289)*, pp. 1-15, Match 2022, DOI: 10.48550/arXiv.2203.08289.
- [4] V. Sethu, E. Mower Provost, J. Epps, C. Busso, N. Cummins, and S. Narayanan "The ambiguous world of emotion representation," *ArXiv e-prints 1909.00360*, pp. 1-19, September 2019, DOI: 10.48550/arXiv.1909.00360.
- [5] S.-F. Chang, A. Hauptmann, L.-P. Morency, S. Antani, D. Bulterman, C. Busso, J. Chai, J.

Hirschberg, R. Jain, K. Mayer-Patel, R. Meth, R. Mooney, K. Nahrstedt, S. Narayanan, P. Natarajan, S. Oviatt, B. Prabhakaran, A. Smeulders, H. Sundaram, Z. Zhang, and M. Zhou, "Report of 2017 NSF workshop on multimedia challenges, opportunities and research roadmaps," ArXiv e-prints (arXiv:1908.02308), pp. 1-150, August 2019, DOI: 10.48550/arXiv.1908.02308.

INVITED TALKS &
PRESENTATIONS

Busso, Carlos (2024). "Multimodal Machine Learning for Human-Centric Tasks", Seminar at IEEE webinar, graduate student seminar series at West Virginia University, Virtual Seminar (Hosted by Prof. Dr. Sarika Khushalani Solanki, 10/07/2024).

Busso, Carlos (2024). "Toward Social AI Systems that Recognize and Synthesize Human Behaviors", Keynote at Workshop on Artificial Social Intelligence at the University of Glasgow, Glasgow, Scotland (Hosted by Prof. Tanaya Guha and Alessandro Vinciarelli, 09/20/2024).

Busso, Carlos (2024). "Automatic Emotion Detection/ Recognition, A Survey", Invited survey talk at Interspeech 2024, Kos Island, Greece (Invited by Prof. Plinio A. Barbosa , 09/04/2024).

Busso, Carlos (2024). "Toward Robust and Discriminative Emotional Speech Representations", Keynote at Odyssey 2024, Quebec, Canada (Hosted by Prof. Berrak Sisman, 06/20/2024).

Busso, Carlos (2024). "Facial Expression Analysis with Focus on Speech Articulation", Keynote at the FG 2024 Workshop Advancements in Facial Expression Analysis and Synthesis: Past, Present, and Future (Hosted by Itir Onal Ertugrul and Laszlo A Jeni, 05/27/2024).

Busso, Carlos (2024). "Building Speech-Based Affective Computing Solutions by Leveraging the Production and Perception of Human Emotions", Seminar at the Harvard-MIT Speech and Language Biomarker Interest Group, Virtual Seminar (Hosted by Daniel Low, 5/6/2024).

Busso, Carlos (2024). "Multimodal generation of data-driven human-like behaviors for socially interactive agents", Keynote at IEEE VR 2024 2nd Annual Workshop on Multi-modal Affective and Social Behavior Analysis and Synthesis in Extended Reality (MASSXR), Orlando, FL, USA (Hosted by Prof. Funda Durupinar, 03/17/2024).

Busso, Carlos (2024). "Toward Robust Speech Emotion Recognition: Challenges, Advances and Opportunities", SCS Special Seminar at Carnegie Mellon University, Pittsburgh, PA (Hosted by Prof. David Mortensen, 02/19/2024).

Busso, Carlos (2023). "Robust Multimodal Machine Learning", NTHU Internet of Senses Research Center Seminar Series, Seminar at National Tsing Hua University (NTHU), Hsinchu City, Taiwan (Hosted by Prof. Chi-Chun Lee, 12/21/2023).

Busso, Carlos (2023). "Can the Production and Perception of Human Emotions Inspire Speech-Based Affective Computing?", Keynote at IEEE Automatic Speech Recognition and Understanding Workshop, (Hosted by Prof. Chi-Chun Lee, Prof. Yu Tsao, and Prof. Hsin-Min Wang, 12/19/2023).

Busso, Carlos (2023). "Multimodal machine learning for human-centric tasks", Center for Language & Speech Processing (CLSP) Seminar, Johns Hopkins University, Baltimore, MD, USA (Hosted by Prof. Najim Dehak, 11/17/2023).

Busso, Carlos (2023). "Advances in multimodal machine learning solutions for speech processing tasks", IIT Ropar Data Science talk, Virtual seminar (Hosted by Prof. Abhinav Dhall, 6/28/2023).

Busso, Carlos (2023). "Advances in multimodal machine learning solutions for speech processing tasks", Amazon Alexa Distinguished Speaker Series, Virtual seminar (Hosted by Dr. Yang Liu, 6/29/2023).

Busso, Carlos and Fei Tao (2023). "Advances on Multimodal Machine Learning Solutions for Speech Processing Tasks and Emotion Recognition", IEEE Signal Processing Society Webinar, (Hosted by Michelle Demydenko and Nanette Januszkiewicz, 01/19/2023).

Busso, Carlos (2022). "Robust Emotion Recognition", IEEE Signal Processing Society, Bangalore Chapter, at Indian Institute of Science, Bangalore, India (Hosted by Dr. Sriram Ganapathy, 11/09/2022).

Busso, Carlos (2022). “Robust Emotion Recognition”, Invited Tech Talk at Amazon, (Hosted by Dr. Chao Wang, 11/01/2022).

Busso, Carlos (2020). “Multimodal Emotion Recognition: Understanding the production process before modeling multimodal behaviors”, Keynote at the workshop Speech, Music and Mind (SMM2020), (Hosted by Dr. Venkatasubramanian Viraraghavan, 10/23/2020).

Busso, Carlos (2020). “Temporal Head Pose Estimation from Point Cloud in Naturalistic Driving Conditions”, Seminar at Texas Analog Center of Excellence (TxACE) at UT Dallas (Hosted by Prof. Ken O, 10/7/2020)

Busso, Carlos (2020). “Multimodal Assessment of Visual Attention and Driving Anomalies”, Virtual Lunch & Learn seminar at Affectiva (Hosted by Dr. Taniya Mishra, 4/28/2020).

Busso, Carlos (2020). “Multimodal Emotion Analysis and Synthesis: From audiovisual interplay to contextual information in dyadic human interaction”, Keynote at the international conference on Multimodal Modeling (MMM 2020), Deajeon, South Korea (Hosted by Dr. Yong Man Ro, 1/8/2020).

Busso, Carlos (2019). “Driving Anomaly Detection With Conditional Generative Adversarial Network”, Seminar at Texas Analog Center of Excellence at UT Dallas (Hosted by Prof. Ken O, 11/20/2019).

Busso, Carlos, Vidhyasaharan Sethu, Shrikanth Narayanan (2019). “The Ambiguous World of Emotion Representation”, Tutorial at the International Conference on Affective Computing and Intelligent Interaction ACII 2019, Cambridge, UK (9/3/2019).

Busso, Carlos (2019). “Tracking the Behavior and Visual Attention of a Driver Using Multimodal Sensors in Naturalistic Scenarios”, eSeminar hosted by Texas Analog Center of Excellence (Hosted by Prof. Ken O, 6/21/2019).

Busso, Carlos (2018). “Generating data-driven human-like behaviors for conversational agents”, Keynote at International Workshop on Multimodal Analyses enabling Artificial Agents in Human-Machine Interaction (MA3HMI 2018) (Hosted by Dr. Ronald Böck, 10/16/2018)

Busso, Carlos (2018). “Probabilistic estimation of visual attention”, Seminar at Texas Analog Center of Excellence (TxACE) at UT Dallas (Hosted by Prof. Ken O, 10/10/2018)

Busso, Carlos (2018). “Deep Learning Architectures for Audiovisual Speech Recognition”, Keynote at Multimodal HCI Workshop at Northwestern Polytechnical University (NPU) (Hosted by Prof. Dongmei Jiang, 05/14/2018)

Busso, Carlos (2018). “Novel Formulations and Deep Learning Structures for Robust Speech Emotion Recognition Systems”, Keynote at Apple (Hosted by Dr. Vikramjit Mitra, 05/04/2018)

Busso, Carlos (2018). “Novel Formulations for Speech Emotion Recognition”, Keynote at Cogito Presents: Behavioral Signal Processing and Machine Learning (Hosted by Dr. John Kane, 03/29/2018).

Busso, Carlos (2018). “Tracking Distractions and Visual Attention Using Multiple Noninvasive Sensors”, Seminar at Texas Instrument (Hosted by Dr. Aish Dubey, 02/14/2018).

Busso, Carlos (2017). “Speech emotion recognition: are we there yet?”, Keynote at 2nd International Workshop on Automatic Sentiment Analysis in the Wild (WASA 2017) (10/23/2017).

Busso, Carlos (2017). “Speech emotion recognition: Robustness and generalization”, Seminar at Alibaba (Hosted by Dr. Gang Liu, 07/18/2017).

Busso, Carlos (2016). “Challenges in robust speech emotion recognition in mismatched conditions”, Visit at the Matsuyama lab at Kyoto University, Tokyo, Japon (hosted by Dr. Hiroaki Kawashim and Dr. Rodrigo Verschae, 11/17/2016)

Busso, Carlos (2016). “Robust speech emotion recognition in mismatched conditions”, Statistical Machine Learning Seminar, Richardson, Texas, USA (hosted by Dr. Richard Golden, 04/15/2016).

- Busso, Carlos (2016). “Emotion in Group”, Catalyzing Research in Multimodal Learning Analytics Workshop, Bloomington, Indiana (hosted by Dr. Marcelo Worsley and Dr. Cindy Hmelo-Silver, 02/21/2016).
- Busso, Carlos (2016). “Multimodal Signal Processing: Current Research Directions”, UTSW/UTD Medical Simulation and Training Workshop, Richardson, Texas, USA (hosted by Dr. Ann Majewicz, 01/22/2016).
- Busso, Carlos (2015). “Feature normalization and model adaptation for robust speech emotion recognition in mismatched conditions”, Seminar at The University of New South Wales, Advanced Signal Processing Workshop, Sydney, Australia (hosted by Dr. Julien Epps, 04/17/2015).
- Busso, Carlos (2014). “Multimodal Analysis, Recognition and Synthesis of Expressive Human Behaviors”, Seminar at Koç Üniversitesi, Istanbul, Turkey (hosted by Dr. Engin Erzin, 11/11/2014).
- Carlos Busso (2014). “Tracking Driver Distractions Using Multiple Noninvasive Sensors”, Seminar at Philips, Eindhoven, The Netherlands (hosted by Dr. Murtaza Bulut, 11/10/2014).
- Provost, Emily Mower and Carlos Busso (2014). “Computational Models for Audiovisual Emotion Perception”, TUTORIAL at INTERSPEECH 2014, Singapore (09/14/2014).
- Busso, Carlos (2014). “Using Neutral Models and Contextual Information to Improve Speech Emotion Recognition Systems”, Professorial talk at Columbia University, New York, NY 10027 (hosted by Dr. Julia Hirschberg, 07/02/2014).
- Busso, Carlos (2014). “Multimodal Analysis, Recognition and Synthesis of Expressive Human Behaviors”, VASC Seminar at Carnegie Mellon University, Pittsburgh, PA 15213 (hosted by Dr. Kris Kitani, 06/30/2014).
- Busso, Carlos (2014). “Compensation of Lexical and Speaker variability for Emotional Recognition”, Seminar at The University of Pennsylvania at Philadelphia, PA 19104, USA (hosted by Dr. Ani Nenkova, 01/27/2014).
- Busso, Carlos (2013). “Improving the Robustness of Emotional Speech Detection Systems”, Seminar at The University of Texas A&M, College Station, TX 77843, USA (hosted by Dr. Ricardo Gutierrez-Osuna, 11/18/2013).
- Busso, Carlos (2013). “Improving the Robustness of Emotional Speech Detection Systems”, Seminar at The University of Texas at San Antonio, San Antonio, TX 78249, USA (hosted by Dr. Ram Krishnan, 11/01/2013).
- Busso, Carlos (2013). “Modeling of Driver Behavior in Real World Scenarios Using Multiple Non-invasive Sensors”, AI Seminar at The University of Michigan, Ann Arbor, MI 48109, USA (hosted by Dr. Emily Mower Provost, 10/22/2013).
- Busso, Carlos (2013). “Keep Your Eyes on the Road, Your Hands Upon the Wheel”, Tech on Tap Seminars, Trinity Hall Irish Pub & Restaurant, Dallas TX 75206, USA (hosted by Beth Keithly, 03/06/2013).
- Busso, Carlos (2012). “Improving the Robustness of Emotional Speech Detection Systems”, Seminar at The University of Texas at Arlington, Arlington TX 76019, USA (hosted by Dr. Ioannis Schizas, 04/06/2012).
- Busso, Carlos (2011). “Tracking expressive nonverbal behavior: a multimodal approach”, FLASH (Friday Seminars in Speech, Language and Hearing) Brown Bag Series at the Callier Center, The University of Texas at Dallas, Dallas TX 75235, USA (hosted by Dr. William F. Katz, 10/21/2011).
- Busso, Carlos (2011). “Recognition and synthesis of human behaviors: A multimodal approach”, Seminar at Texas Instrument, Dallas, TX, USA (hosted by Dr. Branislav Kisanin, 04/08/2011).
- Busso, Carlos (2011). “Recognition and synthesis of human behaviors: A multimodal approach”, Dallas Chapter of IEEE Signal Processing Society Seminar, The University of Texas at Dallas, Richardson, TX, USA (hosted by Dr. Nasser Kehtarnavaz, 02/23/2011).

Busso, Carlos, John H.L. Hansen (2010). “Advances in Human Assessment: (i) Tracking Nonverbal Behavior (ii) Speaker Variability for Speaker ID”, 2010 Fall Seminar Series, The Center for Language and Speech Processing (CLSP) at Johns Hopkins University, Baltimore, MD, USA (hosted by Dr. Hynek Hermansky, 10/26/2010).

Busso, Carlos (2009). “New Directions in the Automatic Recognition of Emotion in Speech”. Seminar at The University of Texas at El Paso, El Paso, TX, USA (hosted by Dr. David Novick and Nigel Ward, 10/21/2009).

Busso, Carlos (2009). “New directions on automatic emotion speech recognition”, Seminar at The University of North Texas, Denton, TX, USA (New directions on automatic emotion speech recognition) (hosted by Dr. Oscar Garcia, 10/15/2009).

Busso, Carlos (2009). “Multimodal Analysis of Expressive Human Communication: Speech and gesture interplay”, Seminar at The University of Texas at Dallas, Richardson, TX, USA (hosted by Dr. John Hansen and Dr. Hlaing Minn, 03/24/2009).

Busso, Carlos (2009). “Multimodal Processing of Human Behavior in Intelligent Instrumented Spaces: A Focus on Expressive Human Communication”, Information Science Institute (ISI) Natural Language Seminar talks, Marina del Rey, CA, USA (hosted by Dr. Sujith Ravi, 02/27/2009)

Busso, Carlos (2009). “Multimodal Processing of Human Behavior in Intelligent Instrumented Spaces: A Focus on Expressive Human Communication” Seminar at Nokia, Santa Monica, CA, USA (hosted by Dr. Lance Williams, 01/08/2009).

Busso, Carlos (2008). “Multimodal Processing of Human Behavior in Intelligent Instrumented Spaces: A Focus on Expressive Human Communication” Microsoft, Redmond, WA, USA. (hosted by Dr. Zhengyou Zhang, 05/05/2008).

LICENSE REVENUE: Note: \$348,979.00 in total license revenue.

MSP-Podcast Corpus	\$314,979.00
MSP-Conversation Corpus	\$18,000.00
MSP-IMPROV Corpus	\$16,000.00

GRANTS & CONTRACTS: Note: \$5,568,404.64 in total research funding, \$4.1M as PI. The list only includes UTD’s portion for collaborative projects.

Active Research Projects:

2024-2024 Laboratory for Analytic Sciences (NC State University); \$110,198
“Language-specific adaptation for cross-lingual speech emotion recognition”
PI: Carlos Busso
January 1, 2024 - December 31, 2024

2023-2028 UTSW Interagency Cooperation Contract (ICC); \$174,066.00
“Face the Future: Assessing Speech Articulation in Pediatric Craniofacial Patients through Machine Learning”
PI: Carlos Busso
September 1, 2023 - August 31, 2028

- 2020-2024 National Science Foundation (NSF) - CNS: 2016719; \$1,075,386
 “CCRI: New: Creating the largest speech emotional database by leveraging existing naturalistic recordings”
 PI: Carlos Busso
 REU supplement, 2021-2022 (\$16,000)
 September 1, 2020 - August 31, 2024
- 2019-2024 National Institute of Health (NIH)- R01:1R01MH122367-01 ; \$189,813
 “SCH: INT: Collaborative Research: Passive Sensing of Social Isolation and Loneliness: a Digital Phenotyping Approach”
 co-PI: Carlos Busso (UTD sub-contract, in collaboration with Dr. Daniel Fulford (PI) at BU, David Gard at UCSC, Jukka-Pekka Onnela at Harvard)
 September 23, 2019 - August 31, 2024
- 2018-2024 National Institute of Health (NIH)- R01:5R01CA218739-04 ; \$180,363
 “Endogenous Fluorescence Lifetime Endoscopy for Early Detection of Oral Cancer/dysplasia”
 co-PI: Carlos Busso (UTD sub-contract, in collaboration with Dr. Javier Jo at OU)
 April 1, 2018 - August 31, 2024

Completed Research Projects::

- 2023-2023 Laboratory for Analytic Sciences (NC State University); \$103,628
 “Improving Speech Emotion Recognition with Task-Agnostic and Task-Depend Self-Supervised Learning”
 PI: Carlos Busso
 January 1, 2023 - December 31, 2023
- 2022-2022 Laboratory for Analytic Sciences (NC State University); \$85,430
 “Ordinal speech emotion recognition: Rank-order emotional speech with preference learning ”
 PI: Carlos Busso
 January 1, 2022 - December 31, 2022
- 2020-2023 National Science Foundation (NSF) - IIP: 1950249; \$80,000
 “STTR Phase I: A Self-Learning Approach for In-Vehicle Driver and Passenger Monitoring Through a Sensor Fusion Approach”
 PI: Rajesh Narasimha, Senior personal: Naofal Al-Dhahir and Carlos Busso
 March 3, 2020 - November 30, 2020
- 2019-2020 Honda Research Institute (HRI) ; \$97,227
 “Driving anomaly detection based on multi-modal fusion of driver behavioral signals and external scene information”
 PI: Carlos Busso
 February 1, 2019 - May 21, 2021
- 2020-2021 NEC Foundation Research Grant ; \$50,000
 “Multimodal engagement analysis of students for online education”
 PI: Carlos Busso
 February 15, 2020 - February 14, 2021
- 2018-2019 Honda Research Institute (HRI) ; \$86,079.64
 “Driver anomaly detection based on driver/vehicle sensor signals”
 PI: Carlos Busso
 September 17, 2018 - September 13, 2019

- 2018-2019 NEC Foundation Research Grant ; \$50,000
 “Tracking facial emotional variations on videos: separating lexical and emotional information with novel deep learning solutions”
 PI: Carlos Busso
 September 1, 2018 - August 30, 2019
- 2018-2020 National Science Foundation (NSF) - CNS: 1823166; \$99,390
 “CRI: CI-P: Creating the Largest Speech Emotional Database by Leveraging Existing Naturalistic Recordings”
 PI: Carlos Busso
 REU supplement, 2019-2020 (\$8,000)
 REU supplement, 2018-2019 (\$8,000)
 September 1, 2018 - February 28, 2021
- 2018-2020 SRC/Texas Analog Center of Excellence: Task 2810.014 ; \$180,000
 “Deep Learning Solutions for ADAS: From Algorithms to Real-World Driving Evaluations”
 PI: Carlos Busso, co-PI: Naofal Al-dhahir
 January 1, 2018 - December 31, 2020
- 2017-2020 National Science Foundation (NSF) - IIS: 1718944; \$494,116
 “RI: Small: Integrative, Semantic-Aware, Speech-Driven Models for Believable Conversational Agents with Meaningful Behaviors”
 PI: Carlos Busso
 REU supplement, 2020-2021 (\$8,000)
 REU supplement, 2019-2020 (\$8,000)
 REU supplement, 2018-2019 (\$8,000)
 REU supplement, 2017-2018 (\$8,000)
 September 1, 2017 - August 31, 2021
- 2017-2018 SRI / The Combating Terrorism Technical Support Office (CTTSO) ; \$239,951
 “Intrinsic Voice Variability Factors and Speaker Recognition: Detection and Assessment”
 PI: John H.L. Hansen , Co-PI: Carlos Busso
 January 2, 2018 - March 30, 2019
- 2017-2018 Biometric Center of Excellence (BCOE) ; \$290,189
 “Automatic Audio Stream Processing to Address Diverse Mismatch Scenarios for Speaker Verification”
 PI: John H.L. Hansen , Co-PI: Carlos Busso
 June 1, 2017 - November 30, 2018
- 2016-2017 Biometric Center of Excellence (BCOE) ; \$202,264
 “Speaker Variability - Advancements in Detection and Knowledge Integration of Emotion, Task Stress, Vocal Effort for Speaker Verification in Naturalistic Environments”
 PI: John H.L. Hansen , Co-PI: Carlos Busso
 March 1, 2016 - November 31, 2017

- 2015-2020 National Science Foundation (NSF) - IIS: 1453781; \$495,853
“CAREER: Advanced Knowledge Extraction of Affective Behaviors During Natural Human Interaction”
PI: Carlos Busso
REU supplement, 2019-2020 (\$8,000)
REU supplement, 2018-2019 (\$8,000)
REU supplement, 2017-2018 (\$8,000)
REU supplement, 2016-2017 (\$8,000)
REU supplement, 2015-2016 (\$8,000)
September 1, 2015 - August 31, 2021
- 2016-2017 Microsoft Research; \$30,000
“Support for Data Collection”
PI: Carlos Busso
March 1, 2016 - February 28, 2017
- 2015-2016 National Science Foundation (NSF) - IIS: 1540944; \$11,040
“FG 2015 Doctoral Consortium: Travel Support for Graduate Students”
PI: Carlos Busso
April 1, 2015 - March 31, 2016
- 2014-2016 Robert Bosch LLC; \$30,000
“Detecting Emotionally Salient Speech Segments for Speech Summarization”
PI: Carlos Busso
September 1, 2014 - May 30, 2015
- 2014-2017 National Science Foundation (NSF) - IIS: 1450349; \$19,732
“EAGER: Feasibility of Using Speech as Biomarker for Concussions”
PI: Carlos Busso (UTD sub-contract, in collaboration with Dr. Christian Poellabauer, PI at University of Notre Dame)
September 1, 2014 - August 31, 2017
- 2013-2014 Samsung Telecommunications America, LLC; \$120,146
“SRA: Farsi Speech Recognition Project”
co-PI: Carlos Busso (PI: John Hansen)
January 1, 2014 - December 31, 2014
- 2013-2016 National Science Foundation (NSF) - IIS: 1352950; \$82,552
“EAGER: Investigating the Role of Discourse Context in Speech-Driven Facial Animations”
PI: Yang Liu, co-PI: Carlos Busso
September 1, 2013 - February 28, 2016
- 2013-2016 National Science Foundation (NSF) - IIS: 1346655; \$17,840
“WORKSHOP: Doctoral Consortium for the International Conference on Multimodal Interaction (ICMI 2013)”
PI: Carlos Busso
July 1, 2013 - June 30, 2016
- 2013-2014 National Science Foundation (NSF) - IIS: 1329659; \$59,338
“EAGER: Exploring the Use of Synthetic Speech as Reference Model to Detect Salient Emotional Segments in Speech”
PI: Carlos Busso
March 15, 2013 - August 31, 2014

- 2012-2014 Samsung Telecommunications America, LLC; \$441,898
 “Advancements in Automatic Speech Recognition: Corpus Development, Model Training, Dialect/Accent, and Hands-Free Interaction”
 co-PI: Carlos Busso (PI: John Hansen)
 November 1, 2012 - December 31, 2014
- 2012-2016 National Science Foundation (NSF) - IIS: 1217104; \$201,573
 “RI: Small: Collaborative Research: Exploring Audiovisual Emotion Perception using Data-Driven Computational Modeling”
 PI: Carlos Busso (Emily Mower Provost, University of Michigan, Ann Arbor, MI)
 September 1, 2012 - August 31, 2016
- 2012-2014 National Science Foundation (NSF) - IIS:1249319; \$14,587
 “WORKSHOP: Doctoral Consortium for 14th International Conference on Multimodal Interaction”
 PI: Carlos Busso
 August 1, 2012 - July 31, 2014
- 2011-2012 Samsung Telecommunications America, LLC; \$151,745
 “Standardization of Advanced User Interface for Mobile Devices”
 PI: Carlos Busso
 September 15, 2011 - September 14, 2012

GRADUATE
 ADVISEE:

Current Students:

- PhD Students Abinay Reddy Naini, “Speech emotion recognition,” January 2022 -present
 Luz Martinez-Lucas, “Speech emotion recognition”, May 2022 - present
 Pravin Mote, “Multimodal emotion recognition”, August 2022 - present
 Karen Rosero, “Face analysis for healthcare applications”, January 2023 - present
- Ms. Students Christian Flores “Efficient multimodal systems”, August 2024-present
 Patarapornkan Anantarangsi “multimodal emotion recognition”, Jan. 2025-present

PhD Student Alumni:

- [1] Kayla Caughlin (2020-2024) – TBA
PhD Thesis: “Classification Methods for Automated, Non-Invasive In Vivo Oral Cancer Diagnosis”
- [2] Lucas Goncalves (2020-2024) – Amazon, New York, NY
PhD Thesis: “Robustness and Versatility in Multimodal Emotion Recognition”
- [3] Seong-Gyun Leem (2020-2024) – TBA
PhD Thesis: “Speech Emotion Recognition in the Presence of Background Noise”
- [4] Ali N. Salman (2018-2024) – TBA
PhD Thesis: “Personalized Video Facial Expression Recognition on the Edge”
- [5] Andrea Vidal (2018-2023) – Openstream.AI, Bridgewater, NJ
PhD Thesis: “Synthesizing lip movements and modeling human behavior by using generative models and graph neural networks”
- [6] Wei-Cheng (Winston) Lin (2019-2023) – Robert Bosch, Pittsburgh, PA
PhD Thesis: “Improving Temporal Modeling and Generalization for Speech Emotion Recognition”
- [7] Yuning Qiu (2018-2022) – Intel, Austin, TX
PhD Thesis: “Unsupervised Driving Anomaly Detection in Naturalistic Driving Scenarios”
- [8] Kusha Sridhar (2017-2021) – Rice University, Houston, TX
PhD Thesis: “Unsupervised Personalization and Deep Uncertainty Modeling for Speech Emotion Recognition”
- [9] Sumit Jha (2016-2021) – Samsung Research America, Irvine, CA

- PhD Thesis*: “Novel Modeling of Driver Attention in Real World Scenarios using Probabilistic Salient Maps”
- [10] Srinivas Parthasarathy (2015-2019) – Amazon, Sunnyvale, CA
PhD Thesis: “Novel Frameworks for Attribute-Based Speech Emotion Recognition using Time-Continuous Traces and Sentence-Level Annotations”
 - [11] Mohammed AbdelWahab (2013-2019) –AT&T Labs Research, Bedminster, NJ
PhD Thesis: “Domain Adaptation for Speech Based Emotion Recognition.”
 - [12] Fei Tao (2013-2018) – Uber, San Francisco, CA
PhD Thesis: “Advances in audiovisual speech processing for robust voice activity detection and automatic speech recognition”
 - [13] Reza Lotfian (2013-2018) – Cogito, Boston, MA
PhD Thesis: “Machine Learning Solutions for Emotional Speech: Exploiting the Information of Individual annotations.”
 - [14] Najmeh Sadoughi (2013-2017) – EMR.AI, San Francisco, CA
PhD Thesis: “Synthesizing Naturalistic and Meaningful Speech-Driven Behaviors.”
 - [15] Nanxiang (Sean) Li (2011-2015) – Honda Research Institute, Mountain View, CA
PhD Thesis: “Modeling of Driver Behavior in Real World Scenarios using Multiple Noninvasive Sensors.”
 - [16] Soroosh Mariooryad (2010-2014) – Google, Mountain View, CA
PhD Thesis: “Improving Robustness of Emotion Recognition Systems: Continuous Emotion Descriptors, Contextual Information and Lexical Compensation.”

Visiting Scholars and Post-Doctoral Researcher Alumni:

- [1] Jing-Tong Tzeng (2024) – National Tsing Hua University
- [2] Huang-Cheng (David) Chou (2021-2022) – National Tsing Hua University
- [3] Yakup Kutlu (2013) – Mustafa Kemal University, Hatay, Turkey
- [4] Youngkwon Lim (2011-2012) – Samsung Telecommunications America, Richardson, TX
- [5] Juan Pablo Arias (2010-2011) –Adexus, Santiago, Chile

Ms. Student Alumni:

- [1] Lucas Goncalves (2020-2023) – PhD student at UT Dallas, Richardson, TX
- [2] Alec Burmania (2016-2018) – Lennox International, , TX
Ms. Thesis: “Methods and experimental design for collecting emotional labels using crowdsourcing.”
- [3] Yunjie Zhang (2015-2017) – PhD student at UT Dallas, Richardson, TX
- [4] Anil Jakkam (2015-2016) – Knowles Intelligent Audio, Mountain View, CA
Ms. Thesis: “A Multimodal Analysis of Synchrony during Dyadic Interaction Using a Metric Based on Sequential Pattern Mining.”
- [5] Sumit Jha (2015-2016) – PhD student at UT Dallas, Richardson, TX
Ms. Thesis: “Analysis and Estimation of Driver Visual Attention using Head Position and Orientation in Naturalistic driving Conditions.”
- [6] Srinivas Parthasarathy (2012-2014) – PhD student at UT Dallas Richardson, TX
Ms. Thesis: “Relation Between Emotion Classification Performance and Evaluator Agreement with Absolute and Relative Descriptors.”
- [7] Sheldon Dsouza (2012) – Apple, Cupertino, CA
- [8] Tauhidur Rahman (2010-2012) – PhD student at Cornell University, Ithaca, NY
Ms. Thesis: “Improving robustness of emotional speech detection system.”
- [9] Shalini Keshavamurthy (2010-2011) – UtopiaCompression Corp, Los Angeles, CA
- [10] Jinesh Jain (2010-2011) – Ford Motors Company, Palo Alto, CA
Ms. Thesis: “Driver Distraction: Multimodal analysis and modeling of driver behavior in real-world scenarios.”

- [11] Anand Batlagundu (2010) – Qualcomm, San Diego, CA
- [12] Somu Palaniappan (2010) – NSN - Nokia Solutions and Networks, Irving Texas
- [13] Premkumar Sridhar (2009) – Ericsson Inc, Dallas, TX

Undergraduate Alumni:

- [1] Christian Flores (2024)
- [2] Shruthi Subramaniam (2020-2023)
- [3] Isaac Brooks (2020-2023)
- [4] Olivia Bonin (2021)
- [5] Luz Martinez-Lucas (2018-2021)
- [6] Jarrod Luckenbaugh (2019-2021)
- [7] Kayla Caughlin (2019-2020)
- [8] Tiancheng Hu (2018-2020)
- [9] John Harvill (2018-2019)
- [10] Elizabeth Higgins (2018-2019)
- [11] Asim Gazi (2017-2018)
- [12] Dorothy Mantle (2017-2018)
- [13] Michelle Bancroft (2016-2018)
- [14] Alec Burmania (2012-2016)
- [15] Jaejin Cho (2014 - 2015)
- [16] Preston Luthy (2015)
- [17] Zackary R Lindstrom (2013- 2014)
- [18] Tam Tran (2011 - 2013)

CLASSROOM TEACHING:	2024	Fall	EE3302.001	Signals and Systems
	2024	Spring	EE3302.001	Signals and Systems
	2023	Fall	ENGR2300.501	Linear Algebra for Engineers
	2023	Spring	EE3302.001	Signals and Systems
	2022	Fall	ENGR2300.501	Linear Algebra for Engineers
	2022	Spring	EESC6360.001	Digital Signal Processing I
	2021	Fall	ENGR2300.004	Linear Algebra for Engineers
	2021	Spring	EESC6360.001	Digital Signal Processing I
	2020	Fall	EE3302.003	Signals and Systems
	2020	Spring	ENGR2300.HON	Linear Algebra for Engineers
	2020	Spring	EESC6360.001	Digital Signal Processing I
	2019	Fall	EE3302.002	Signals and Systems
	2019	Spring	ENGR2300.HON	Linear Algebra for Engineers
	2019	Spring	EESC6360.001	Digital Signal Processing I
	2018	Fall	EE3302.002	Signals and Systems
	2018	Spring	ENGR2300.502	Linear Algebra for Engineers
	2018	Spring	EESC6368.001	Multimodal Signal Processing
	2017	Fall	ENGR2300.006	Linear Algebra for Engineers
	2017	Spring	ENGR2300.002	Linear Algebra for Engineers
	2017	Spring	ENGR2300.502	Linear Algebra for Engineers
2016	Fall	EESC6360.502	Digital Signal Processing I	
2016	Spring	ENGR2300.002	Linear Algebra for Engineers	
2016	Spring	EESC6360.501	Digital Signal Processing I	

2015	Fall	EESC6360.502	Digital Signal Processing I
2015	Summer	ENGR2300.0U1	Linear Algebra for Engineers
2015	Spring	EESC6368.001	Multimodal Signal Processing
2015	Spring	ENGR2300.002	Linear Algebra for Engineers
2014	Fall	EESC6360.001	Digital Signal Processing I
2014	Spring	ENGR2300.001	Linear Algebra for Engineers
2014	Spring	ENGR2300.002	Linear Algebra for Engineers
2013	Fall	EESC6349.001	Random Processes
2013	Spring	ENGR2300.001	Linear Algebra for Engineers
2013	Spring	ENGR2300.002	Linear Algebra for Engineers
2012	Fall	EESC6349.001	Random Processes
2012	Summer	ENGR2300.0U1	Linear Algebra for Engineers
2012	Spring	ENGR2300.002	Linear Algebra for Engineers
2012	Spring	EE7V85.501	Special Topics in Signal Proc. - Multimodal Signal Processing
2011	Fall	ENGR2300.003	Linear Algebra for Engineers
2011	Spring	ENGR2300.002	Linear Algebra for Engineers
2010	Fall	ENGR2300.001	Linear Algebra for Engineers
2010	Spring	EE7V85.501	Special Topics in Signal Proc.- Multimodal Signal Processing