JENNY M. VOJTECH

CONTACT INFORMATION

Alias: Jennifer M. Vojtech
Address: 111 Cummington Mall
Room 225D – 2nd Floor
Boston, MA 02215 USA

Voice: (617) 358-4501
Email: jmvo@bu.edu
Web: jennyvojtech.com

EXPERIENCE

Boston University Boston, MA, USA	2023–Present	Research Assistant Professor
Delsys, Inc. & Altec, Inc. Natick, MA, USA	2023 2020–2023 2019	Senior Research Scientist Research Scientist Visiting Scholar
Boston University Boston, MA, USA	2015–2020 2017	Doctoral Research Assistant Graduate Teaching Fellow ▪ *Signals & Systems in Biomedical Engineering* ▪ *Biomedical Measurements*
University of Maryland College Park, MD, USA	2014–2015	Undergraduate Research Assistant
U.S. Food and Drug Administration Silver Spring, MD, USA	2013	Program Analyst

EDUCATION

2015–2020	Ph.D. (Biomedical Engineering) Boston University, Boston, MA, USA *Thesis: Acoustic and videoendoscopic techniques to improve voice assessment via relative fundamental frequency* *Advisor: Cara E. Stepp*
2015–2019	M.S. (Biomedical Engineering) Boston University, Boston, MA, USA
2011–2015	B.S. (Bioengineering) University of Maryland, College Park, MD, USA *Cum Laude*

CURRENT RESEARCH FUNDING

Adaptive and Individualized AAC 02/2022–01/2025

Role: PI

This goal of this grant is to provide a novel means of the assistive communication for people with severe motor impairments by leveraging advances in wearable access technology to develop an augmentative and alternative communication (AAC) device that enables versatile access and automatically customizes a keyboard interface to an individual's residual motor capabilities.

COMPLETED RESEARCH FUNDING

Non-Contact Solution for Quantitative Clinical Management of MTD 02/2022–01/2023

Role: PI

This goal of this grant is to develop clinical software for speech language pathologists to inform the assessment and treatment of muscle tension dysphonia (MTD) using a smart phone app that automatically identifies speech characteristics correlated to muscle tension, providing a series of exercises to assess and improve MTD with compliance feedback both patient and clinician.

SpeechSense: A Wearable Monitor for Speech Disorders 06/2022–11/2023

Role: Key Personnel

This goal of this grant is to provide a proof-of-concept that speech deficits measured by SpeechSense in the presence of noise sources have a high degree of correlation with gold-standard acoustic assessments obtained from the same scripted tasks in controlled noise-free conditions.

REFEREED JOURNAL PUBLICATIONS

Vogel, A.P., Spencer, C., Burke, K. de Bruyn, D., Gibilisco, P, Blackman, S., **Vojtech, J.M.**, & Kathiresan, T. Optimizing Communication in Ataxia: A Multifaceted Approach to Alternative and Augmentative Communication (AAC). *Cerebellum*, 1–10, 2024.

Al-Mfarej, D., **Vojtech, J.M.**, Roy, S. H., Townsend, E., Keysor, J. J., Kuntz, N., Rao, V., Kline, J. C., & Shiwani, B. "A Virtual Reality Exergame: Clinician-Guided Breathing and Relaxation for Children with Muscular Dystrophy." In *Proceedings - 2023 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops,* 270–276. Institute of Electrical and Electronics Engineers, Inc., 2024.

Buckley, D.P., **Vojtech, J.M.**, & Stepp, C.E. "Relative fundamental frequency in individuals with globus syndrome and muscle tension dysphagia," *Journal of Voice*, 38(3), 612–8, 2024.

Groll, M.D., Peterson, S.D., Zañartu, M., **Vojtech, J.M.**, & Stepp, C.E. "Empirical Evaluation of the Role of Vocal Fold Collision on Relative Fundamental Frequency in Voicing Offset," *Journal of Voice*, S0892-1997(22)00291-0, 2022.

Vojtech, J.M., Mitchell, C.L., Raiff, L. Kline, J.C., & De Luca, G. "Prediction of Voice Fundamental Frequency and Intensity from Surface Electromyographic Signals of the Face and Neck," *Vibration*, 5(4), 692–710, 2023.

McKenna, V.S., **Vojtech, J.M.**, Previtera, M., Kendall, C.L., & Carraro, K.E. "A Scoping Literature Review of Relative Fundamental Frequency (RFF) in Individuals with and without Voice Disorders," *Applied Sciences*, 12, 8121, 2022.

Mitchell, C.L., Cler, G.J., Fager, S.K., Contessa, P., Roy, S.H., De Luca, G., Kline, J.C., & **Vojtech, J.M.** "Ability-Based Methods for Personalized Keyboard Generation," *Multimodal Technologies and Interaction*. 2022, 6, 67.

Mitchell, C.M., Cler, G.J., Fager, S.K., Contessa, P., Roy, S.H., De Luca, G., Kline, J.C., & **Vojtech, J.M.** "Ability-based Keyboards for Augmentative and Alternative Communication: Understanding How Individuals' Movement Patterns Translate to More Efficient Keyboards," In *CHI Conference on Human Factors in Computing Systems Extended Abstracts (CHI EA '22)*. Association for Computing Machinery, New York, NY, USA, Article 412, 1–7, 2022.

Vojtech, J.M., & Stepp, C.E. "Effects of Age and Parkinson's disease on the Relationship between Vocal Fold Abductory Kinematics and Relative Fundamental Frequency," *Journal of Voice*, 38(5), 1008–22, 2022.

Kapsner-Smith, M.R., Díaz Cádiz, M.E., **Vojtech, J.M.**, Buckley, D.P., Mehta, D.D., Hillman, R.E., Tracy, L.F., Noordzij, J.P., Eadie, T.L., & Stepp, C.E. "Clinical Cutoff Scores for Acoustic Indices of Vocal Hyperfunction that Combine Relative Fundamental Frequency and Cepstral Peak Prominence," *Journal of Speech, Language, and Hearing Research*, 65(4), 1349–69, 2022.

Groll, M. D., **Vojtech, J.M.**, Hablani, S., Mehta, D. D., Buckley, D. P., Noordzij, J. P., & Stepp, C. E. "Automated relative fundamental frequency algorithms for use with neck-surface accelerometer signals," *Journal of Voice,* 36(2), 156–169, 2022.

Vojtech, J.M., Cilento, D.D., Luong, A.T., Noordzij, Jr., J.P., Diaz-Cadiz, M.C., Groll, M.D., Buckley, D.P., McKenna, V.S., Noordzij, J.P., & Stepp, C.E. "Acoustic identification of the voicing boundary during intervocalic offsets and onsets based on vocal fold vibratory measures," *Applied Sciences,* 11(9), 3816, 2021.

Vojtech, J.M., Chan, M.D., Shiwani, B., Roy, S.H., Heaton, J.T., Meltzner, G.S., Contessa, P., De Luca, G., Patel, R., & Kline, J.C. "Surface EMG-based recognition, synthesis and perception of prosodic subvocal speech," *Journal of Speech, Language, and Hearing Research*, 64(6S), 2134–53, 2021.

Park, Y., Wang, F., Diaz-Cadiz, M., **Vojtech, J.M.**, Groll, M.D., & Stepp, C.E. "Vocal fold kinematics and relative fundamental frequency as a function of obstruent type and speaker age," *The Journal of the Acoustical Society of America,* 149(4), 2189–99, 2021.

Groll, M. D., Hablani, S., **Vojtech, J.M.**, & Stepp, C. E. "Cursor click modality in an accelerometer-based computer access device," *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, *28*(7), 1566–72, 2020.

Vojtech, J.M., Hablani, S., Cler, G.J., & Stepp, C.E. "Integrated head-tilt and electromyographic cursor control," *IEEE Transactions on Neural Systems and Rehabilitation Engineering,* 28(6), 1442–51, 2019.

Vojtech, J.M., Segina, R. K., Buckley, D. P., Kolin, K. R., Tardif, M. C., Noordzij, J. P., & Stepp, C. E. "Refining algorithmic estimation of relative fundamental frequency: Accounting for sample characteristics and fundamental frequency estimation method," *The Journal of the Acoustical Society of America*, 146(5), 3184, 2019.

Cler, G.J., Kolin, K.R., Noordzij Jr., J.P., **Vojtech, J.M.**, & Stepp, C.E. "Optimized and predictive phonemic interfaces for augmentative and alternative communication," *Journal of Speech, Language, and Hearing Research*, 62(7), 2065–81, 2019.

Diaz-Cadiz, M., McKenna, V.S., **Vojtech, J.M.**, & Stepp, C.E. "Adductory vocal fold kinematic trajectories during conventional speed versus high-speed videoendoscopy," *Journal of Speech, Language, and Hearing Research*, 62(6), 1687–1706, 2019.

Vojtech, J.M., Noordzij Jr., J.P., Cler, G.J., & Stepp, C.E. "Effects of fundamental frequency and speech rate on the intelligibility, communication efficiency, and perceived naturalness of synthetic speech," *American Journal of Speech-Language Pathology*, 28(2S), 875–86, 2019.

Vojtech, J.M., Cler, G.J., & Stepp, C.E. "Prediction of optimal facial electromyographic sensor configurations for human-machine interface control," *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 26(8), 1566–76, 2018.

Vojtech, J.M., Cano-Mejia, J., Dumont, M.F., Sze, R.W., Fernandes, R. "Biofunctionalized Prussian Blue Nanoparticles for Multimodal Molecular Imaging Applications," *Journal of Visualized Experiments*, (98), e52621, 2015.

INVITED BOOK CHAPTERS

Vojtech J.M. & Stepp C.E. (2021). Electromyography. *Manual of Clinical Phonetics.* Martin J. Ball (editor).

Stepp C.E. & **Vojtech J.M.** (2019). Speech Naturalness. *The SAGE Encyclopedia of Human Communication Sciences and Disorders.* Martin J. Ball (editor), Jack S. Damico (editor).

CONFERENCE ABSTRACTS AND PROPOSALS:

Madoule, M.M., Marks, K.L., Nagle, K.F., Vojtech, J.M., & Stepp, C.E. "Quantitative Analysis of Speech-Language Pathologists' Voice Evaluation Practices and Perspectives," 2024 Fall Voice Conference, Phoenix, AZ, USA, October 24–27, 2024, [poster presentation].

Gill, A., Raiff, L., Kirchgessner, E., Stepp, C.E., Kline, J.C., & **Vojtech, J.M.** "Validation of an automated relative fundamental frequency analysis for clinical voice evaluation," 15th International Conference on Advances in Quantitative Laryngology, Voice and Speech Research, Phoenix, AZ, USA, March 30–April 1, 2023, [poster presentation].

Kapsner-Smith, M.R., Díaz Cádiz, M.E., **Vojtech, J.M.**, Buckley, D.P., Mehta, D.D., Hillman, R.E., Tracy, L.F., Noordzij, J.P., Eadie, T.L., & Stepp, C.E. "Clinical Cutoff Scores for Acoustic Indices of Vocal Hyperfunction that Combine Relative Fundamental Frequency and Cepstral Peak Prominence," 51st Annual Voice Foundation, Philadelphia, PA, USA, June 1–5, 2022, *Accepted*. [poster presentation].

Carraro, K.E., Kendall, C.L., Previtera, M., **Vojtech, J.M.**, & McKenna, V.S. "A scoping literature review of relative fundamental frequency in individuals with and without voice disorders," 51st Annual Voice Foundation, Philadelphia, PA, USA, June 1–5, 2022, *Accepted*. [poster presentation].

Vojtech, J.M., Chan, M.D., Shiwani, B., Roy, S.H., Heaton, J.T., Meltzner, G.S., Contessa, P., De Luca, G., Patel, R., & Kline, J.C. "Surface EMG-Based AAC Technology for Recognition of Silent Prosodic Speech," XXVIII Congress of the International Society of Biomechanics (ISB), Stockholm, Sweden, July 25–29, 2021. [podium presentation]

Vojtech, J.M. & Stepp, C.E., "Effects of Age, Sex, and Parkinson's Disease on Kinematic and Acoustic Features of Phonatory Offset," The 14th International Conference on Advances in Quantitative Laryngology, Voice and Speech Research, Bogotá, Colombia, June 7–10, 2021. [podium presentation]

Vojtech, J.M., Cilento, D.D., Luong, A.T., Noordzij, Jr., J.P., Diaz-Cadiz, M.C., Groll, M.D., Buckley, D.P., McKenna, V.S., Noordzij, J.P., & Stepp, C.E., "Acoustic Identification of the Voicing Boundary during Intervocalic Offsets and Onsets based on Vocal Fold Vibratory Measures," The 14th International Conference on Advances in Quantitative Laryngology, Voice and Speech Research, Bogotá, Colombia, June 7–10, 2021. [podium presentation]

Groll, M.D., Peterson, S., Zañartu, M., **Vojtech, J.M.** & Stepp, C.E., "Evaluating the relationship between relative fundamental frequency and the end of vocal fold collision in voicing offset," The 14th International Conference on Advances in Quantitative Laryngology, Voice and Speech Research, Bogotá, Colombia, June 7–10, 2021. [podium presentation]

Park, Y., Wang, F., **Vojtech, J.M.**, Groll, M.D., & Stepp, C.E., "Differences in Vocal Fold Kinematics and Relative Fundamental Frequency between Voiceless Fricatives and Stops," The Voice Foundation, Philadelphia, PA, USA, May 27–31, 2020. [podium presentation]

Vojtech, J.M., Chan, M.D., Shiwani, B., Roy, S.H., Heaton, J.T., Meltzner, G.S., Contessa, P., De Luca, G., Patel, R., & Kline, J.C., "sEMG-to-Speech AAC: Subvocal Recognition & Synthesis of Prosodic Speech," Motor Speech Conference, Santa Barbara, CA, USA, February 19–23, 2020. [podium presentation]

Vojtech, J.M., Hablani, S., Cler, G.J., & Stepp, C.E., "Integrated head-tilt & surface electromyographic cursor control for augmentative and alternative communication," Motor Speech Conference, Santa Barbara, CA, USA, February 19–23, 2020. [poster presentation]

Vojtech, J.M., Kolin, K.R., Segina, R.K., & Stepp, C.E. "Optimization of relative fundamental frequency algorithms: accounting for sample characteristics and fundamental frequency estimation method," The 13th International Conference on Advances in Quantitative Laryngology, Voice and Speech Research, Montreal, Quebec, Canada, June 2-4, 2019. [podium presentation]

Diaz-Cadiz, M.E., McKenna, V.S., **Vojtech, J.M.**, & Stepp, C.E. "Adductory vocal fold kinematic trajectories during conventional speed vs. High-speed videoendoscopy," International Conference on Voice Physiology and Biomechanics, East Lansing, MI, USA, August 1–3, 2018. [poster presentation]

Vojtech, J.M., Noordzij Jr., J.P., Cler, G.J., & Stepp, C.E. "Effects of prosody on the intelligibility, communication efficiency, and perceived naturalness of synthetic speech in augmentative and alternative communication," Conference on Motor Speech, Savannah, GA, USA, February 22–25, 2018. [poster presentation]

Vojtech, J.M., Cler, G.J., Fager, S., & Stepp, C.E. "Predicting optimal surface electromyographic control of communication devices in individuals with motor speech disorders," Conference on Motor Speech, Savannah, GA, USA, February 22–25, 2018. [poster presentation]

Cler G.J., **Vojtech, J.M.**, Kolin, K.R., Noordzij Jr., J.P., & Stepp, C.E. "Empirical evaluation of communication interfaces optimized for individuals with motor speech disorders," Conference on Motor Speech, Savannah, GA, USA, February 22–25, 2018. [poster presentation]

Vojtech, J.M., Cler, G.J., & Stepp, C.E., "A feature extraction method for predicting electromyographic sensor configurations to optimize human-machine interface control," Annual Symposium in Quantitative Biology and Physiology and Translational Research in Biomaterials, Boston University, Boston, MA, USA, December 15, 2017. [poster presentation]

Vojtech, J.M., Cler, G.J., & Stepp, C.E., "A feature extraction method for predicting electromyographic sensor configurations to optimize human-machine interface control," Boston University Department of Biomedical Engineering Retreat, Newport, RI, USA, October 5–6, 2017. [poster presentation]

Vojtech, J.M., Cler, G.J., Noordzij, Jr., J.P., & Stepp, C.E., "Evaluation of facial electromyographic sensor configuration for optimizing human-machine interface control," Boston Speech Motor Control Mini-Symposium, Boston University, Boston, MA, USA, March 31, 2017. [poster presentation]

Sweeney, E.E., **Vojtech, J.M.**, Sze, R.W., Li, C., Zhu, Y., Fernandes, R. "Engineered nanoparticles for theranostics of malignant peripheral nerve sheath tumors," Biomedical Engineering Society (BMES) 2015 Annual Meeting, Tampa, FL, USA, October 7–10, 2015. [podium presentation]

Vojtech, J.M., Sweeney, E.E., Sze, R.W., Fernandes, R. "Synthesis of an activatable and site-specific tumor paint using Prussian blue nanoparticles," University of Maryland Undergraduate Research Day, College Park, MD, USA, April 29, 2015. [poster presentation]

Reissig, C.J. & **Vojtech, J.M.** "A comparison of drug-related deaths in Florida, 2007–2012," 76th Annual meeting of the College on Problems of Drug Dependence, San Juan, Puerto Rico, June 14–19, 2014. [poster presentation]

INVITED TALKS

Vojtech, J.M. "Unlocking the Secrets of Voice: A Deep Dive into Physiology and Signal Processing," *2024 Voice AI Symposium Workshop, presented by the Bridge2AI-Voice Consortium*, Tampa, FL, USA, May 1, 2024.

Vojtech, J.M. "Discovering how machine learning can help us to enhance, define, and understand our communication ability," *Digital Transformation in the Development of Rehabilitation Sciences: The Current Challenge to Use State-Of-The-Art Technology in Therapeutic Management*, Santiago, Chile, October 10, 2023.

Vojtech, J.M. "Personalizing Augmentative and Alternative Communication Technologies through sEMG- and IMU-based Systems," *2021 Boston Speech Motor Control Symposium*, Boston, MA, USA, June 18, 2021.

Vojtech, J.M. "Personalizing Assistive Communication Technologies through sEMG- and IMU-based Systems," *International Conference on Biomedical Robotics and Biomechatronics (BioRob): Advancing Assistive Robotics through Intelligent Physiological Sensing Workshop*, New York City, New York, USA, November 29, 2020.

Vojtech, J.M. "Surface electromyography in speech and swallowing research," *Workshop on the Advances in Cognitive impairments, Aging, and Dysphagia*, Alzheimer's Disease & Cognitive Rehabilitation Committee, Chinese Association of Rehabilitation Medicine, Beijing, China, September 19, 2020.

Vojtech, J.M. "Surface electromyographic technology for new possibilities in speech and swallowing research," *Symposium of the De Luca Foundation on Motor Control in Speech, Voice, & Swallowing*, Beijing, China, July 2, 2019.

Vojtech, J.M. "Facial electromyographic control of communication interfaces for individuals with motor speech disorders," *Symposium of the De Luca Foundation on Motor Control in Speech, Voice, & Swallowing*, Beijing, China, July 2, 2019.

Vojtech, J.M. "Effects of modulating fundamental frequency and speech rate on the perception of synthetic speech," Boston Speech Motor Control Working Group, Boston, MA, USA, June 5, 2018.

Vojtech, J.M. & Stepp, C.E., "Predicting optimal surface electromyographic control of human-machine interface devices in individuals with motor impairments," Delsys Seminar Series, Delsys, Inc., Natick, MA, USA, October 27, 2017.

RESEARCH ADVISING

Shuangqi Wu, MS in Speech-language Pathology 2022–2023
Thesis Committee Member
Thesis: *Identifying Mandarin Lexical Tones Using Neck and Face Surface Electromyography*

Michael Madoule, MS in Speech-language Pathology 2022–2024
Thesis Committee Member
Thesis: *Clinical translation of an acoustic measure of vocal strain:A mixed methods study*

AWARDS & HONORS

May 2017–May 2020	National Science Foundation Graduate Research Fellowship (DGE-1247312)
Sept 2015–Sept 2016	NIH Training Program in Quantitative Biology and Physiology
Aug 2013	Citation in Life Sciences, College Park Scholars Program

PROFESSIONAL SERVICE

2022–Present	Reviewer	**NSERC Discovery Grants**

PROFESSIONAL AFFILIATIONS

Association for Computing Machinery

PROFESSIONAL ASSOCIATIONS AND MEMBERSHIPS

2015–2020	Member	**Graduate Women in Science and Engineering**
2015–2020	Member	**Student Association of Graduate Engineers**
2012–2015	Member	**National Society of Collegiate Scholars**
2015–2016	Member	**Startup Shell**

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SCIENTIFIC OUTREACH

Bridg2AI Voice Series on Voice Signal Processing, presented lecture on "From Anatomy to Algorithms: Foundations & Innovations in Voice" to clinicians and scientists	June 2024
Senior Project Advisor: Improving the Accessibility and Efficiency of Relative Fundamental Frequency Algorithm	2019–2020
Panel Member discussing New Frontiers in Neurological Devices at Harvard Brain Science Initiative's Academia-Industry Neuro Fair	Oct 2019
Host for BU Research Internship in Science and Engineering (RISE) program	June–Aug 2018
Experimental demonstrations, hands-on activities, and discussion with elementary and middle school science students for the Johns Hopkins University Center for Talented Youth (CTY)	Oct 2017
Podium presentation and panel discussion to graduate students applying for funding, sponsored by the BU chapter of the Graduate Women in Science and Engineering	Sept 2017
Experimental demonstrations and discussions of the STEPP Lab with middle and high school science students for "Bring your Kid to BU Day"	Feb 2017
Outreach presentation and experimental demonstration for University of Maryland's annual Maryland Day	2011–2015