Curriculum Vitae: Hasini R. Weerathunge

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EDUCATION & CREDENTIALS

BOSTON UNIVERSITY, BOSTON USA, Department of Biomedical Engineering.
Ph.D. in Biomedical Engineering, anticipated in May 2023, GPA (3.78/4.0)
UNIVERSITY OF MORATUWA, SRI LANKA, Department of Electronics & Telecommunication Engineering. BSc. Eng (Hons) in Electronics and Telecommunication Engineering, April 2015, GPA (3.7/4.2)

PUBLICATIONS

Weerathunge. H.R, Tomassi, N. E., & Stepp C., (2022) What can altered auditory feedback paradigms tell us about vocal motor control in individuals with voice disorders? Perspectives of the ASHA Special Interest Groups. (*In press*)

Abur D., Subaciute A., Daliri A., Lester-Smith R., Lupiani A.A., Cilento D., Enos N.M., **Weerathunge H.R.,** Tardif M.C., & Stepp C.E., (2021). Feedback and Feedforward Auditory-Motor Processes for Voice and Articulation in Parkinson's disease. Journal of Speech, Language, and Hearing Research.

Tomassi, N. E., **Weerathunge, H. R.**, Cushman, M. R., Bohland, J. W., Stepp, C. E. (2021) Assessing ecologically valid methods of auditory feedback measurement in individuals with typical speech. Journal of Speech, Language, and Hearing Research.

Dahl K.L., **Weerathunge H.R.,** Buckley D.P., Dolling A.S., Díaz-Cádiz M., Tracy L.F., Stepp C.E., (2021). Reliability and accuracy of expert auditory-perceptual evaluation of voice via telepractice Platforms. American Journal of Speech-Language Pathology.

Weerathunge H. R., Segina R. K., Tracy L. & Stepp C. (2021). Accuracy of Acoustic Measures of Voice via Telehealth Platforms, Journal of Speech, Language, and Hearing Research.

Weerathunge, H. R., Abur, D., Enos, N. M., Brown, K. M., & Stepp, C. E. (2020). Auditory-motor perturbations of voice fundamental frequency: feedback delay and amplification. Journal of Speech, Language, and Hearing Research, 63(9), 2846-2860.

Kearney, E., Nieto-Castañón, A., **Weerathunge, H. R**., Falsini, R., Daliri, A., Abur, D., & Scott, T. L. (2020). A Simple 3-Parameter Model for Examining Adaptation in Speech and Voice Production. Frontiers in Psychology, 10, 2995.

Weerathunge, W. A. H. R., Bandara, D. M., Amaratunga, M. G., & Silva, A. C. (2016). Robust algorithm for objective hearing screening of newborns using Automated Auditory Brain-stem Response.Moratuwa Engineering Research Conference (MERCon), 149 - 155.

MANUSCRIPTS IN REVIEW & PREPARATION

Weerathunge. H.R, Alzamendi G.A., Cler G.J., Guenther F.H., Stepp C.E., Zañartu M., LaDIVA: A neurocomputational model of laryngeal motor control for speech acquisition and production (*in review*)

Weerathunge. H.R, Voon T., Tardiff M., Cilento D. & Stepp C.E. Auditory and Somatosensory Feedback Mechanisms of Laryngeal and Articulatory Speech Motor Control. (*in review*)

Weerathunge. H.R, Cushman M., Feaster T., Dunsmuir C., Abur D., & Stepp C.E. Auditory and Somatosensory Feedback Mechanisms of Laryngeal and Articulatory Speech Motor Control in persons with Parkinson's Disease. (*in prep*)

Weerathunge. H.R, Cushman M., Feaster T., Dunsmuir C., & Stepp C.E. Effects of Dopaminergic Medication on Laryngeal and Articulatory Motor Control Mechanisms in persons with Parkinson's Disease. (*in prep*)

Weerathunge. H.R, & Stepp C.E. Characterization of Vocal Motor Control using Laryngeal Kinematics in individuals with Hyperfunctional Voice Disorders. (*in prep*)

Weerathunge. H.R, Tan D., & Stepp C.E. Impact of Speech Rate and Speaker-modulated Vocal Effort on Laryngeal Kinematics in persons with Parkinson's Disease. (*in prep*)

RESEARCH PRESENTATIONS

Weerathunge. H.R.*, Alzamendi G.A., Cler G.J., Guenther F.H., Stepp C.E., Zañartu M. (2022). *LaDIVA: A neurocomputational model providing laryngeal motor control for speech acquisition and production,* 21st Biennial Madonna Motor Speech Conference, February 16 – 20, 2022, Charleston, SC (*Oral Presentation*)

Weerathunge. H.R.*, Voon T., Tardiff M., Cilento D. & Stepp C.E. (2022). *Auditory and Somatosensory Feedback Mechanisms of Laryngeal and Articulatory Speech Motor Control,* 21st Biennial Madonna Motor Speech Conference, February 16 – 20, 2022, Charleston, SC (*Poster Presentation*)

Dahl, K. L.*, **Weerathunge, H. R.**, Buckley, D. P., Dolling, A. S., Díaz-Cádiz, M. E., Tracy, L. F., & Stepp, C. E. (2021). *Reliability of expert auditory-perceptual evaluations of voice via telepractice platforms*, Technical Research, ASHA Convention, November 18–20, 2021, Virtual/Washington, D.C. (*Oral Presentation*)

Weerathunge, H. R.*, Bohland, J.W. (2021) *Modeling studies of speech production under delayed auditory feedback.* Boston Speech Motor Control Symposium, Virtual/Boston, June 17-18, 2021 (*Poster Presentation*)

Weerathunge, H. R.*, Segina, R. K., Tracy, L. F., & Stepp, C. E. (2021) *Accuracy of Acoustic Measures of Voice via Telepractice Video Conferencing Platforms.* 14th International

Conference on Advances in Quantitative Laryngology, Voice, and Speech Research, Virtual/Bogotá, Colombia, June 7-10, 2021(*Oral Presentation*)

Dahl, K. L.*, **Weerathunge, H. R.**, Buckley, D. P., Dolling, A. S., Díaz-Cádiz, M. E., Tracy, L. F., & Stepp, C. E. (2021). *Reliability of expert auditory-perceptual evaluations of voice via telepractice platforms.* 14th International Conference on Advances in Quantitative Laryngology, Voice, and Speech Research, Virtual/Bogotá, Colombia*,* June 7-10, 2021(*Oral Presentation*)

Weerathunge H.R.*, Abur D., Enos N., Brown K. & Stepp C. E. (2020) *Auditory-Motor Perturbations of Voice Fundamental Frequency: Feedback Delay and Amplification.* 20th Biennial Madonna Motor Speech Conference, February 16 – 20, 2020, Santa Barbara, CA. (*Poster Presentation*)

TEACHING EXPERIENCE

Graduate Teaching Fellow, Introduction to Programming (BU EK 125: Fall 2020)

- Conducted Exam Revision Sessions and Lab Sections, Held Office Hours, Prepared Assignments, Project evaluation and grading duties

Graduate Teaching Assistant, Biomedical Signal Processing (BU BE 535: Fall 2019)

- Conducted Discussion Sections, Held Office Hours, Prepared Assignments, and grading duties

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MENTORING EXPERIENCE

Master's Thesis Committee, Department of Speech, Language & Hearing Sciences, Boston University

- Dilys Tan (Fall 2021 – Spring 2022)

Mentoring Research Assistants

- Training undergraduates and research associates on calibration techniques and experimental setups for data collection across behavioral studies and computational analysis of data

Women In Neuroscience (WIN) Mentoring Program (2021)

- Mentor for WIN 2021 program

Sustainable Education Foundation: ScholarX Program (SEL)

- Mentor for undergraduate students (2021)

Sri Lankan American Knowledge Exchange (SLAKE)

- Mentor for Sri Lankan undergraduate students (2020 - 2021)

RESEARCH EXPERIENCE

Stepp Lab for Sensorimotor Rehabilitation Engineering. *PI Dr. Cara Stepp* (*Boston University, USA*)

GRADUATE RESEARCH ASSISTANT (Fall 2017 – Present)
Speech science, auditory- and somatosensory-motor perturbation studies, and computational modeling of speech motor control

- Auditory perturbation paradigms to investigate the effects of varied delays and amplifications in auditory feedback. Study setup design, acoustic data collection from subjects, and data analysis. Results Published in JSLHR.
- Contribution to the NIH-supported project "Voice and Speech Sensorimotor Control in Parkinson's Disease". Contribution to Aims 1 and 2 of the grant via comprehensive behavioral experimentation on patients with Parkinson's disease (PD) and age-sex matched adults to identify auditory responses to both auditory and somatosensory perturbations to voice and speech. Data collected to be utilized to modify a neuro-computational model reflecting PD based variations in the speech motor control system.
- Contribution to Boston University Clinical & Translational Science Institute COVID-19 Pilot Grant "Accuracy of Acoustic Measures of Voice via Tele-Therapy Platforms". Assessing validity of acoustic measures used during telepractice, leveraging an existing database of acoustic recordings from individuals with voice disorders, recorded in-person in a soundproof booth. Main research investigator and first author of the publication in JSLHR listing the results of the project.

The Voice Lab. ***PI. Dr. Matias Zanartu*** (*Federico Santa Maria Techincal University, Chile*)
GRADUATE RESEARCH ASSISTANT (January 2020)
Contribution to FONDECYT research grant "Neurophysiological control for a computational lumped mass model of the vocal folds" which is supported by CONICYT Chile.

- Modification of the speech motor control model DIVA to include laryngeal parameters as controlled variables.
- Incorporation of a laryngeal model to the DIVA neural speech motor control model, which could provide insight on how neural control of speech acts in relation with mechanical control of the larynx.

Bohland Lab*. PI Dr. Jason Bohland* *(Boston University, USA)*
GRADUATE RESEARCH ASSISTANT (Fall 2018)
Contribution to the NSF-supported project "The effects of delayed auditory feedback on speech sequencing: acoustics, physiology, and computational modeling"

- Developed the initial modeling simulations for objective 2 of the grant titled "Neural modelling of Delayed Auditory Feedback based speech errors by using a cortical rhythm hypothesis in a competitive queuing network based on the GODIVA model for speech sequencing".
- Developed MATLAB based differential equation models for 1) feedback based response suppression in a competitive queuing network based on a simplified GODIVA model and 2) Phase coupled cortical rhythms and amplitude coupled production and perception signals to the cortical rhythms, to identify the percentage of perception of the delayed feedback signal and thus quantification of errors in perception.

Guenther Lab*. PI Dr. Frank Guenther* *(Boston University, USA)*
GRADUATE RESEARCH ASSISTANT (Fall 2018 - Spring 2019)
Contribution in exploring the application feasibility of a simplified speech motor control model (simpleDIVA) in data fitting from various studies.

- Applied a simplified DIVA model on published Parkinson's disease patient behavioral data on sensorimotor adaptation experiments from STEPP lab.

- Developed a Graphic User interface was developed for the model as part of the collaborated tasks. (http://sites.bu.edu/guentherlab/software/simplediva-app/)

Premium International, *PI Dr. Nuwan Dayananda* (*University of Moratuwa, Sri Lanka*).
RESEARCH ENGINEERING INTERN (Feb 2014 - June 2014)
3D reconstruction of Human Anatomy, Cadaver Dissection Software Toolkit for minimum invasive surgery

- Experience in image processing and 3D reconstruction technologies utilizing Medical Imaging toolkits (VTK, ITK and Slicer); Algorithms: Ray casting, K-means clustering*)*

PROFESSIONAL EXPERIENCE

Synergen Technology Labs LLC, *Dallas, Texas USA* *https://www.synergentl.com/*
RESEARCH ENGINEER (July 2016 – Dec 2017)

- **Application Development:** Research & Algorithm Development (C, Java, Python, MATLAB) for medical wearables and IoT solutions for customer requirements. Exposure in Bio signal acquisition (EEG/ECG/PPG), signal conditioning algorithms, processing and analytics.
- **Firmware Development:** Algorithm implementation in firmware (embedded C, C++); Communication Protocols: Bluetooth/ BLE, UART, SPI, I2C ; Architectures: TI – RTOS ; Biosensors: IMU, SPO2; Exposure in TI chips (ADS1299 / CC2640), Invensense MPU9250.
- **Projects:** Algorithm, firmware and mobile app backend development ;
  - Motion based algorithms to track human motion, posture, and activity rate for fitness wearables.
  - PPG based heart rate, respiratory rate, sleep analysis (based on heart rate variability)
  - Gesture Recognition API using machine learning and time series pattern matching techniques to be used in consumer wearable applications.
  - Microphone noise suppression &cry detection algorithms for application in IoT devices.

PROFESSIONAL QUALIFICATIONS

Certified for MDS-UPDRS: International Parkinson & Movement Disorder Society (2020)

AWARDS AND ACHIEVEMENTS

Raymond H. Stetson Scholarship in Phonetics and Speech Production, Acoustical Society of America (2021)

- Honorable Mention

Rafik. B. Hariri Institute for Computing and Computational Science Engineering (Sep 2020)

- Graduate Student Fellowship Awardee

- Host for “Did you know you could” seminar series (2020 – 2022)

Madonna Speech Motor Control Conference (Feb 2020)

- Kathy Yorkston Student Travel Awardee

Distinguished Biomedical Engineering Graduate Fellowship (Feb 2018)

- Fellowship and acceptance to PhD program in BME in Boston University

John Keels Open Innovations Challenge: Finalist. (Nov 2016)
(Among the first 10 teams out of over 150 participating startups)

- Developed project concept and Minimal Viable Product for a smart ring wearable for gesture recognition and fitness tracking

5th South Asia Workshop on Research Frontiers in Computing (June 2015)

- Workshop held in School of Computing, National University of Singapore (Scholarship awarded)

International Physics Olympiad Sri Lankan Team

- 41st International Physics Olympiad (IPHO), Zagreb, Croatia (July 2010): https://ipsl.lk/ipho2010/
- 11th Asian Physics Olympiad (APHO) held in Taipei, Taiwan (April 2010)
- National Gold Medal Winner -Best Performance in Sri Lankan Physic Olympiad Competition

Australian National Chemistry Quiz Competition
(Conducted in Asian Pacific region countries by Royal Australian Chemical Institute)

- 1st place in Asia Pacific region, Junior Division Best Performer (2006)
- High Distinction in the senior division, Royal Australian Chemical Institute (2009)

Sri Lankan Mathematics Competition

- Certificate of Distinction (2009)

Awarded Mahapola scholarship (Merit) (2009)

- For obtaining district rank 34 / country rank 92 (Out of nearly 230,000 candidates) in G.C.E. A/L

Sisu Udana Kusalatha Pranama Merit Scholarship (2007)

- Awarded for best performance in the island in GCE O/L examination

Dialog Axiata Merit Scholarship (2007)

- Awarded for best performance in the island in GCE O/L examination

Devi Swarna Padma Challenge Trophy

- The most outstanding student of the year -Devi Balika Vidyalaya (2007)

Challenge Trophy for Best Performance in G.C.E A/L (2009)

- Highest Z-score Obtained at school level

Best Orator of the Year: English Medium: School colors (2009)

Most Outstanding Student: Secondary Division School colors (2008)

Challenge Trophy for Best Performance in G.C.E O/L: Award for Island wide best Performance

- Ranked 1st in the country (from 540,000 candidates: 2006)

EXTRACURRICULAR ACTIVITIES

Organization for Human Brain Mapping (OHBM) International Online Mentoring Program mentee (2021-2022)

- Mentored by Dr. Douglas Garrett, Senior Research Scientists and PI of Lifespan Neural Dynamics Group, Max Planck UCL Center for Computational Psychiatry and Aging Research.

Mentoring Academic-Research Careers (MARC- ASHA) program mentee (2021-2022)

- Mentored by Dr. Ayoub Daliri, Assistant Professor, College of Health Solutions, Arizona State University

Fundamentals and Applications of Transcranial Magnetic Stimulation (TMS)

- Three-day workshop by Brainbox initiative (Nov 23 – 25, 2021)
- Lectures, discussions, and practical demonstrations of TMS using Brainsight TMS navigation software (single-pulse, paired-pulse, and repeated TMS techniques)
- Required knowledge provided to design, set up, and carry out TMS studies

BR41N.IO Brain Computer Interface designers' Hackathon at IEEE SMC (2021)

- Team Brain troopers: Analyzing motor imagery BCI data from chronic stroke patients to optimize pre-processing, feature extraction and classification algorithms.

Advances in Quantitative Laryngology (AQL) Research Trainee Board (2021-2023)

- AQL 2023 conference planning

ASHA Motor Speech Disorders Committee (2021)

- ASHA 2021 Convention

Hariri institute diversity, Equity & Inclusion Advisory Committee (2020-2021)

- Issue recommendations for a structure and agenda for daily practices in diversity, equity, and inclusion at the Institute (link)

Boston Speech Motor Control Symposium (2021)

- Conference Coordinator and Organizing Committee

Madonna Speech Motor Control Conference (2020)

- Student Volunteer for the Organizing Committee

Graduate Society of Women Engineers (GradSWE)

- Women's Advocacy Chair of GradSWE (2020)
- WE19 National conference of Society of Women in Engineering (2019)

PROFESSIONAL MEMBERSHIPS

- Member, National Student Speech Language Hearing Association (NSSLHA; 2021 to present)
- Member, Acoustical Society of America (ASA; 2021 to present)
- Member, Society of Women Engineers (SWE; 2019 to present)
- Member, American Association for the Advancement of Science (AAAS; 2018)
- Member, Institute of Electrical and Electronics Engineers (IEEE; 2014 – 2017)

I hereby certify that the above-mentioned information is true and correct up to my knowledge.

Thank you for your consideration.

Hasini Rathsara Weerathunge Feb 25th 2022