

Harvard Medical School Curriculum Vitae

Date Prepared: December 28, 2018
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Place of Birth: Kissimmee, FL

Education

2003	BS (summa cum laude)	Electrical Engineering (Advisor: John G. Harris)	University of Florida
2006	SM	Electrical Engineering and Computer Science (Advisor: Thomas F. Quatieri)	Massachusetts Institute of Technology
2010	PhD	Speech and Hearing Bioscience and Technology (Advisor: Robert E. Hillman)	Massachusetts Institute of Technology

Postdoctoral Training

03/10-08/11	Postdoctoral Research Fellow	School of Electrical Engineering and Applied Science (PI: Patrick J. Wolfe)	Harvard University
03/10-09/11	Postdoctoral Research Fellow	Center for Laryngeal Surgery and Voice Rehabilitation (PI: Robert E. Hillman)	Massachusetts General Hospital

Faculty Academic Appointments

09/11-08/12	Research Associate in Electrical Engineering	School of Engineering and Applied Sciences	Harvard University
01/13-05/13	Lecturer	Department of Speech, Language and Hearing Sciences, College of Health & Rehabilitation Sciences: Sargent College	Boston University
10/11-12/16	Instructor	Department of Surgery	Harvard Medical School

09/13-	Adjunct Assistant Professor	Department of Communication Sciences and Disorders, School of Health and Rehabilitation Sciences	MGH Institute of Health Professions
01/17- 03/17-	Assistant Professor Affiliated Faculty	Department of Surgery Program in Speech and Hearing Bioscience and Technology, Division of Medical Sciences	Harvard Medical School Harvard Medical School

Appointments at Hospitals/Affiliated Institutions

10/11-	Research Staff (Assistant Investigator)	Center for Laryngeal Surgery & Voice Rehabilitation	Massachusetts General Hospital
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Other Professional Positions

09/10	Consultant, Department of Linguistics 16 hours	Max Planck Institute for Evolutionary Anthropology
01/13-03/14	Consultant, Voice Production Laboratory 25 hours	Universidad Técnica Federico Santa María
01/13-	Consultant, Bioengineering Systems and Technology Group 8 hours/week	MIT Lincoln Laboratory

Committee Service

Local

2007-2009, 2013	Admissions Committee	Speech and Hearing Bioscience and Technology Doctoral Program, Harvard University (formerly Harvard-MIT Division of Health Sciences & Technology)
2017-	Concentration Chair	Speech and Hearing Bioscience and Technology Doctoral Program, Harvard Division of Medical Sciences
2018-	Academic Advisor	Speech and Hearing Bioscience and Technology Doctoral Program, Harvard Division of Medical Sciences

National and International

12/14-04/15	Scientific Committee Member	11 th International Conference on Advances in Quantitative Laryngology, Voice and Speech Research (AQL) and 4 th International Occupational Voice Symposium (OVS), London, England
04/15-03/16	Scientific Committee Member and Special Session Chair	10 th International Conference on Voice Physiology and Biomechanics (ICVPB), Viña del Mar, Chile

06/16	Special Session Chair	45th Annual Symposium of The Voice Foundation: Care of the Professional Voice, Philadelphia, PA
12/18-6/19	Program Committee Member	13th International Conference on Advances in Quantitative Laryngology, Voice and Speech Research, Montreal, Quebec, Canada

Professional Societies

2001-	Institute of Electrical and Electronics Engineers	Member
2005-	Acoustical Society of America	Associate Member
2012	SPIE–International Society for Optics and Photonics	Early Career Professional Member
2013-	American Speech-Language-Hearing Association	Member Without Certification Ad Hoc Committee Member

Editorial Activities

Editorial board: ASHA Perspectives in Speech Science

Ad hoc reviewer: Adv Otolaryngol, Am J Speech Lang Pathol, Ann Otol Rhinol Laryngol, Biomed Res Int, Biomed Signal Process Control, Clin Linguist Phon, Folia Phoniatr Logop, IEEE J Biomed Health Inform, IEEE Signal Process Lett, IEEE Trans Biomed Eng, J Acoust Soc Am, J Speech Lang Hear Res, Med Biol Eng Comput, Med Princ Pract, PLoS ONE, Proc ICASSP, Proc INTERSPEECH, Speech Commun

Honors and Prizes

2003	Four-Year Scholar Award	University of Florida	Recognized college-wide by a Faculty Selection Committee
2009	First Place Poster Award in Laryngology/Bronchoesophagology (First author)	Eastern Section of the Triological Society	
2009	Best Student Paper in Speech Communication (Co-author)	Acoustical Society of America	
2010	Broyles-Maloney Award (Co-author)	American Broncho-Esophagological Association	Outstanding research paper
2011	Honorary Senior Fellow	Department of Otolaryngology, The University of Melbourne	
2013	Lessons for Success Research Workshop	American Speech-Language-Hearing Association	Selected as one of 30 early-stage scientists

2013	Best Entry for the Depression Recognition Sub-Challenge (Co-author)	Third International Audio/Visual Emotion Challenge (AVEC 2013), 21 st ACM International Conference on Multimedia	Best performance on predicting depression ratings from speech
2014	David W. Brewer Award (Senior author)	43rd Annual Symposium of The Voice Foundation: Care of the Professional Voice	Best poster of the conference
2014	Best Entry for the Depression Recognition Sub-Challenge (Co-author)	Fourth International Audio/Visual Emotion Challenge (AVEC 2014), 22 nd ACM International Conference on Multimedia	Best performance on predicting depression ratings from speech
2015	Director's Team Achievement Award	MIT Lincoln Laboratory	Awarded annually to a small percentage of Laboratory teams recognized for their significant contributions and achievements.
2015	Award for Early Career Contributions in Research	American Speech-Language-Hearing Association	
2015	Meritorious Poster Submission (Senior author)	Annual Convention of the American Speech-Language-Hearing Association	Awarded to a small percentage of poster submissions judged to show extraordinary, exceptional, and innovative work
2016	Hamdan International Presenter Award (Senior collaborating author)	45 th Annual Symposium of the Voice Foundation	Awarded by committee to recognize work of an international presenter
2016	Highest-Rated Student-Authored Paper in Its Convention Topic Area (Senior author)	Annual Convention of the American Speech-Language-Hearing Association	Awarded to the highest-rated student-authored paper in its Convention topic area. Student receives a travel award and registration

Report of Funded and Unfunded Projects

Funding Information

Past

2010-2012 Objective voice quality analysis by spectrogram entropy
 Research Councils United Kingdom (RCUK) Science Bridges
 Subcontract from MIMIT: Manchester Integrating Medicine & Innovative Technology
 (MIMIT)–Center for Integration of Medicine & Innovative Technology (CIMIT)
 Collaborative Project
 PI

- The goal of this project was to take advantage of a new mathematical technique to yield quantitative parameters that correlate highly with perceptions of voice quality. As PI, I oversaw the signal processing effort and also made available clinical voice databases that are critical for the validation of new algorithms.
- 2012-2013 Acoustic impact of vocal fold vibratory irregularities in an *ex vivo* model
American Speech-Language-Hearing Foundation Speech Science Research Grant
PI
The specific aims of this project consisted of analyzing imaging, aerodynamic, and acoustic data to determine relationships between vocal fold vibratory irregularity and acoustic sound characteristics using an excised larynx model. The funding supported a weeklong international collaboration at University Hospital Erlangen in Germany and two student clinicians at MGH, yielding multiple conference proceedings, a peer-reviewed journal article, and a doctoral dissertation.
- 2014-2015 Integrating optical coherence tomography with laryngeal high-speed videoendoscopy
NIH-NIDCD 1 R43 DC013743
Site PI
The goal of this project was to develop a clinical endoscope for imaging vocal fold vibration using the two complementary modalities of optical coherence tomography (OCT) and high-speed videoendoscopy (HSV). As Site PI, I oversaw the integration of HSV technology I developed at MGH with the novel OCT endoscope developed by Physical Sciences, Inc. MGH provided an excised tissue testbed for validating the hybrid OCT-HSV system in preparation for future clinical voice assessment in human subjects.
- 2011-2017 Ambulatory monitoring of vocal function to improve voice disorder assessment
NIH-NIDCD 1 R21 DC011588, 4 R33 DC011588
Co-Investigator: R21 phase (\$275,000), R33 phase (\$1,400,000)
The goal of the first (R21) phase of this project was to develop and test a voice monitoring platform for long-term data acquisition of neck skin acceleration. The R33 phase follows up with a large-sample study to discriminate patients with voice disorders and matched controls. As co-investigator, I oversaw the design and implementation of ambulatory monitoring systems provided to over 200 subjects over the five-year project period. I continue to supervise subject enrollment, mentor students, manage research assistants, and oversee data quality management for the sharing of deidentified information with collaborators.
- Current**
- 2014- Impact of congestive heart failure (CHF) on voice and speech production: A pilot study
MGH Center for Assessment Technology and Continuous Health (CATCH)
Co-Investigator
The purpose of this project is to determine whether acoustic and accelerometric voice-related measures can characterize patients with volume overload before and after successful diuresis of amounts of fluid. As co-investigator, I aid in study design, data collection, and analysis of speech and voice signals from patients with congestive heart failure.
- 2015-2020 Glottal jet aerodynamics
NIH-NIDCD 2 R01 DC005642
Site PI (\$28,728)
The goal of this project is to address the underlying physics of phonation, focusing on how

- the energy in the subglottal airstream is partitioned into work to vibrate the vocal folds and produce sound. As Site PI, I consult on the experimental setup at Penn State University and providing deidentified human subject data from MGH's clinical databases that are important for validating the physics-based models developed during the project.
- 2016-2021 An acoustic estimate of laryngeal tension for clinical assessment of voice disorders
NIH-NIDCD 1 R01 DC015570-01
Site PI (\$66,627)
The goal of this project is to systematically validate an acoustic measure of laryngeal tension called relative fundamental frequency in two voice disorder populations that span age and etiology (functional vs. neurological). As Site PI, I oversee the enrollment of patients at MGH, including the acquisition, processing, and sharing of deidentified data with Boston University from 50–100 patients diagnosed with vocal hyperfunction. The MGH team will also provide consultation on the collection, analysis and interpretation of acoustic data, and will participate in the dissemination of results.
- 2017-2019 Non-invasive estimation of subglottal pressure during natural speech to improve clinical voice assessment
NIH-NIDCD 1 R21 DC015877-01
PI (\$300,000)
The goal of this project is to develop a methodology for estimating subglottal pressure during natural speech using inexpensive accelerometer-based voice monitoring technology that unobtrusively tracks neck-surface vibrations. As PI, I collaborate with MGH clinical staff and overseeing the work of a graduate student/postdoc and an international consultant.
- 2017-2022 Clinical Research Center for Improved Prevention, Diagnosis, and Treatment of Vocal Hyperfunction
NIH-NIDCD 1 P50 DC015446-01A1
PI of Scientific Core (\$3,343,174), Co-Investigator of Project 1
The goal of the proposed project is to establish a Clinical Research Center that brings together a multidisciplinary team of experienced investigators to pursue a comprehensive program of research focused on hyperfunctional voice disorders. As PI of Scientific Core B, I oversee a critical component that provides central services and resources in support of three research projects of the Center.
- 2018-2019 In vivo laryngeal imaging combining parallel OCT with videostroboscopy
NIH-NIDCD 1 R43 DC017407-01
Site PI (\$20,772)
This project seeks to develop a novel three-dimensional clinical imaging system that will combine parallel optical coherence tomography and videostroboscopy to assess vocal fold surface and subsurface during phonation. As Site PI, I oversee and execute benchtop testing of the imaging system at MGH using excised larynx models.

Current Unfunded Projects

- 2016- Identification of denervated laryngeal muscles using low-frequency transcutaneous stimulation
Voice Health Institute
Co-investigator
The purpose of this project is to better characterize the time course of denervation-related movement of the vocal folds in an in vivo large-animal model using low-amplitude, low-frequency transcutaneous electrical stimulation. As co-investigator, my role is to apply my

expertise in high-speed video imaging of the larynx to compute objective measures of vocal fold tissue motion that correlate with transcutaneous stimulation.

Report of Local Teaching and Training

Teaching of Students in Courses

2008	Statistics and Information Sciences Laboratory Seminar (Guest Speaker) 10 master's-level and doctoral students	School of Engineering and Applied Science, Harvard University One 1-hour lecture on image processing
2009	Acoustics of Speech and Hearing (Teaching Assistant) 6 doctoral students in speech and hearing sciences and affiliated fields	MIT-Harvard Health Sciences & Technology Led sections and held office hours for one semester.
2012-	Speech Communication (Guest Lecturer) 10 graduate students in electrical engineering and speech and hearing science disciplines	MIT-Harvard Health Sciences & Technology (now in Harvard Division of Medical Sciences) Three 2-hour sessions each year, digital signal processing and automatic speech recognition
2012-	Signals and Systems (Guest Lecturer) 6–10 graduate students in speech and hearing science disciplines	MIT-Harvard Health Sciences & Technology (now in Harvard Division of Medical Sciences) One 3-hour lecture per year on theory and applications of signal processing

Formal Teaching of Residents, Clinical Fellows and Research Fellows (post-docs)

2011-	Teaching of clinical and research fellows at the MGH Voice Center	20 hours/year effort level
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Laboratory and Other Research Supervisory and Training Responsibilities

2011-	Supervision of research for doctoral students in the Harvard DMS Speech and Hearing Bioscience and Technology Program	Weekly mentorship 5–10 hours/week
2012-	Supervision of research for master's students in the MGH IHP speech-language pathology concentration	Weekly mentorship 5–10 hours/week

Formally Supervised Trainees and Faculty

2011-2013	Shengran W. Feng, PhD student (Harvard-MIT HST-SHBT program) Research advisor. Co-author on one peer-reviewed paper and two conference proceedings.
2012-2014	Melissa L. Cooke, MS (MGH IHP) Research thesis advisor. First author on one of two conference proceedings; Best poster award at Voice Foundation Symposium. Current position: Speech Language Pathologist at Medical University of South Carolina
2012-2016	Jarrad H. Van Stan, PhD (MGH IHP)

- 2013-2014 Research co-advisor. First and co-author on multiple papers and conference proceedings.
Hawazin Aljehani, MS (MGH IHP)
- 2014-2015 Research thesis advisor. First author on one conference proceeding.
Amanda S. Fryd, MS (MGH IHP)
- 2015 Research thesis advisor. First author on one peer-reviewed paper and co-author on one conference proceeding; Meritorious poster award at the Convention of the American Speech-Language-Hearing Association.
Salwa Masud, PhD student (Harvard DMS SHBT program)
- 2015-2016 Research advisor. Research rotation.
Marc Maffei, MS (MGH IHP)
- 2016- Research thesis advisor. Co-author on one peer-reviewed paper and first author on one conference proceeding; Student research travel award recipient (highest-rated student-authored paper in its Convention topic area).
Olivia M. Murton, PhD student (Harvard DMS SHBT program)
- 2017- Research advisor. First author on one peer-reviewed paper and three conference proceedings.
Katherine L. Marks, PhD student (MGH IHP)
- 2018- Research advisor. First author on two conference proceedings.
Thomas Whittico, Masters student (MGH IHP)

Local Invited Presentations

No presentations below were sponsored by outside entities.

- 2007 Graduate student perspectives (seminar for doctoral students)
Harvard-MIT Division of Health Sciences and Technology

Report of Regional, National and International Invited Teaching and Presentations

No presentations below were sponsored by outside entities.

Invited Presentations and Courses

Regional

- 2007-2010 Acoustic Phonetics (Guest Lecturer)
20–60 graduate students in the department of speech-language pathology
MGH Institute of Health Professions
One four-hour lecture each year.
- 2009 Human vocal folds in action
Seminar to engineers and computer scientists at The MathWorks, Natick, MA
- 2010 Impact of human vocal fold vibratory asymmetries on acoustic characteristics of vowel phonation
Speech, Language, and Hearing Sciences Seminar Series, Sargent College, Boston University
- 2010-2011 Speech Analysis (Guest Lecturer)
60 graduate students in the department of speech-language pathology
MGH Institute of Health Professions
One three-hour lecture each year.

- 2011 Introduction to Mass Media (Guest Lecturer)
25 undergraduate students in various liberal arts disciplines
Lasell College
One-hour presentation on voice and speech science.
- 2011-2012 Introduction to Human Communication (Guest Lecturer)
25 undergraduate students in various liberal arts disciplines
Lasell College
One-hour presentation on voice and speech science.
- 2013 Applied Speech Science (Course instructor)
40 Master's-level students in speech-language pathology
Boston University
Two-credit, semester-long course on speech science to provide a clinical research foundation
- 2013 Seeing the human voice from the inside
For the Medical Vision Group at the Computer Science and Artificial Intelligence lab,
Massachusetts Institute of Technology
- 2013 Toward detection of voice disorders using a smartphone platform
New England Chapter of the Applied Voice Input/Output Society (AVIOS)
- 2017 Smartphone-based ambulatory monitoring of vocal function to improve voice disorder assessment
Cogito Corporation, Boston, MA

National

- 2011 Advances in clinical voice assessment
Electrical Engineering Department, University of California Los Angeles
- 2011 Use of laryngeal high-speed videoendoscopy systems to study voice production mechanisms in human subjects
Grand Rounds talk at the Center for Voice and Swallowing, University of California Davis Medical Center
- 2011 Parametric speech production representations for formant tracking and joint source-filter modeling
Department of Electrical Engineering, University of Washington
- 2012 Parametric speech production representations for formant tracking and joint source-filter modeling
Viterbi School of Engineering, University of Southern California
- 2012 Parametric speech production representations for formant tracking and joint source-filter modeling
Center for Spoken Language Understanding, Oregon Health and Science University
- 2012 Role of the mucosal wave in voice production
San Francisco, CA; Joint Meeting of the Pacific Voice Conference and SPIE
- 2013 Laryngeal videostroboscopy: Full exposure
Cincinnati, OH; AQL Workshop course at 10th International Conference on Advances in Quantitative Laryngology
- 2013 Imaging the mucosal wave during voice production
Cincinnati, OH; AQL Workshop course at 10th International Conference on Advances in Quantitative Laryngology

- 2015 Enhancing clinical voice assessment with smartphone-based ambulatory voice monitoring
Roxelyn and Richard Pepper Department of Communication Sciences and Disorders,
Northwestern University
- 2017 Smartphone-based ambulatory monitoring of vocal function
Current Concepts in Laryngeal Surgery and Voice Rehabilitation
University of Chicago and NorthShore University Health System, Evanston, IL
- 2017 Imaging: Stroboscopy, high-speed videoendoscopy, and kymography
University of Northern Iowa, IA
- 2018 Ambulatory monitoring of voice
Southwest Laryngology Conference: Focus on Complex Cases
Mayo Clinic, Phoenix, AZ
- 2018 Toward objective ambulatory measures of vocal status in patients with vocal hyperfunction
11th ICVPB Pre-Conference Symposium on Vocal Effort, Vocal Fatigue, and Vocal Load:
What, How and Where
Michigan State University, East Lansing, MI

International

- 2010 Acoustic correlates of human vocal fold vibratory characteristics
Erlangen, Germany; COST 2103 Workshop course on Advances in Vocal Function Assessment
- 2010 High-speed imaging of the human voice
Leipzig, Germany; Max Planck Institute for Evolutionary Anthropology
- 2011 Vocal fold vibratory asymmetry and its acoustic effects
Olomouc, Czech Republic; Palacký University
- 2011 Vocal fold vibratory asymmetry and its acoustic effects
Atsugi, Kanagawa, Japan; Communication Sciences Laboratories, Nippon Telegraph and Telephone (NTT) Corporation
- 2013 Recent advances in laryngeal high-speed videoendoscopy
Valparaíso, Chile; Universidad Técnica Federico Santa María
- 2013 Current research directions in high-speed videoendoscopy and ambulatory voice monitoring
Erlangen, Germany; ENT Clinic, University Hospital Erlangen
- 2014 Toward detection of voice disorders using a smartphone platform
Valparaíso, Chile; Universidad Técnica Federico Santa María
- 2016 Summer School on Speech Signal Processing (Invited international guest lecturer)
Speech source modeling and applications to students, researchers, and professionals in a weeklong summer school. Three 1.5-hour lectures.
Dhirubhai Ambani Institute of Information and Communication Technology, Gandhinagar, India
- 2017 Update on use of technology for occupational voice
London, UK; 5th Occupational Voice Symposium, University College London
- 2017 Real-world ambulatory monitoring of vocal behavior
Stockholm, Sweden; INTERSPEECH 2017 Conference Tutorial. 3 hours.
- 2017 Use of laryngeal high-speed videoendoscopy systems to study voice production mechanisms in human subjects
ENT Department, Taipei Veterans General Hospital, Taipei, Taiwan
- 2017 Smartphone-based ambulatory monitoring of vocal function to improve voice disorder assessment
National Taipei University of Nursing and Health Sciences, Taipei, Taiwan

Report of Technological and Other Scientific Innovations

- August 23, 2012 Zañartu M, Ho JC, **Mehta DD**, Wodicka GR, Hillman RE. System and methods for evaluating vocal function using an impedance-based inverse filtering of neck surface acceleration. International Patent Publication Number WO 2012/112985. Algorithm for the analysis of speech sensor data to evaluate voice production characteristics. Contributed during development phase and data acquisition of subject data.
- April 23, 2015 Quatieri TF, Williamson JR, Helfer B, Horwitz-Martin RL, Yu B, **Mehta DD**. Using correlation structure of speech dynamics to detect neurological changes. US Publication Number US20150112232 A1. Algorithm for the analysis of speech correlation structure to assess major depressive disorder. Contributed during development phase.

Report of Education of Patients and Service to the Community

Activities

2017	Harvard Science by the Pint Seminar Series/ Invited speaker
	Gave presentation to the public on voice health and methods for imaging.
2010-Present	Serve as Zoroastrian chaplain on campus to foster student, faculty, and staff interfaith engagement.

Report of Scholarship

Publications

Peer reviewed publications in print or other media

Research investigations

1. **Mehta DD**, Deliyski DD, Zeitels SM, Quatieri TF, Hillman RE. Voice production mechanisms following phonosurgical treatment of early glottic cancer. *Ann Otol Rhinol Laryngol* 2010;119(1):1–9. PMID: PMC2833294.
2. **Mehta DD**, Deliyski DD, Quatieri TF, Hillman RE. Automated measurement of vocal fold vibratory asymmetry from high-speed videoendoscopy recordings. *J Speech Lang Hear Res* 2011(1);44:47–54. PMID: PMC3558992.
3. Zañartu M, **Mehta DD**, Ho JC, Wodicka GR, Hillman RE. Observation and analysis of in vivo vocal fold tissue instabilities produced by nonlinear source-filter coupling: A case study. *J Acoust Soc Am* 2011;129(1):326–339. PMID: PMC3055289.
4. Karajanagi SS, Lopez-Guerra G, Park H, Kobler JB, Galindo M, Aanestad J, **Mehta DD**, Kumai Y, Giordano N, d’Almeida A, Heaton JT, Langer R, Herrera VLM, Faquin W, Hillman RE, Zeitels SM. Assessment of canine vocal fold function after injection of a new biomaterial designed to treat phonatory mucosal scarring. *Ann Otol Rhinol Laryngol* 2011;120(3):175–184. PMID: 21510143.
5. **Mehta DD**, Zañartu M, Quatieri TF, Deliyski DD, Hillman RE. Investigating acoustic correlates of human vocal fold vibratory phase asymmetry through modeling and laryngeal high-speed videoendoscopy. *J Acoust Soc Am* 2011;130(6):3999–4009. PMID: PMC3253599.
6. **Mehta DD**, Zeitels SM, Burns JA, Friedman AD, Deliyski DD, Hillman RE. High-speed videoendoscopic analysis of relationships between cepstral-based acoustic measures and voice production mechanisms in patients undergoing phonomicrosurgery. *Ann Otol Rhinol Laryngol* 2012;121(5):341–347. PMID: PMC3756805.
7. **Mehta DD**, Rudoy D, Wolfe PJ. Kalman-based autoregressive moving average modeling and inference for formant and antiformant tracking. *J Acoust Soc Am* 2012;132(3):1732–1746. PMID: 22978900.

8. **Mehta DD**, Zañartu M, Feng SW, Cheyne HA, Hillman RE. Mobile voice health monitoring using a wearable accelerometer sensor and a smartphone platform. *IEEE Trans Biomed Eng* 2012;59(11):3090–3096. PMID: PMC3539821.
9. Zañartu M, Ho JC, **Mehta DD**, Hillman RE, Wodicka GR. Subglottal impedance-based inverse filtering of voiced sounds using neck surface acceleration. *IEEE/ACM Trans Audio Speech Lang Processing* 2013;21(9):1929–1939. PMID: PMC4229092.
10. Ghassemi M, Van Stan JH, **Mehta DD**, Zañartu M, Cheyne II HA, Hillman RE, Guttag JV. Learning to detect vocal hyperfunction from ambulatory neck-surface acceleration features: Initial results for vocal fold nodules. *IEEE Trans Biomed Eng* 2014;61(6):1668–1675. PMID: PMC4077201.
11. **Mehta DD**, Wolfe PJ. Statistical properties of linear prediction analysis underlying the challenge of formant bandwidth estimation. *J Acoust Soc Am* 2015;137(2):944–950. PMID: PMC5392065.
12. Van Stan JH, **Mehta DD**, Hillman RE. The effect of voice ambulatory biofeedback on the daily performance and retention of a modified vocal motor behavior in participants with normal voices. *J Speech Lang Hear Res* 2015;58(3):713–721. PMID: PMC4492465.
13. Llico AF, Zañartu M, González AJ, Wodicka GR, **Mehta DD**, Van Stan JH, Hillman RE. Real-time estimation of aerodynamic features for ambulatory voice biofeedback. *J Acoust Soc Am* 2015;138(1):EL14–EL19. PMID: PMC4499052.
14. Van Stan JH, **Mehta DD**, Zeitels SM, Burns JA, Barbu AM, Hillman RE. Average ambulatory measures of sound pressure level, fundamental frequency, and vocal dose do not differ between adult females with phonotraumatic lesions and matched control subjects. *Ann Otol Rhinol Laryngol* 2015;124(11):864–874. PMID: PMC4605885.
15. Luegmair G, **Mehta DD**, Kobler JB, Döllinger M. Three-dimensional optical reconstruction of vocal fold kinematics using high-speed videomicroscopy with a laser projection system. *IEEE Trans Med Imaging* 2015;34(12):2572–2582. PMID: PMC4666755.
16. Lien YAS, Calabrese C, Michener CM, Heller Murray E, Van Stan JH, **Mehta DD**, Hillman RE, Noordzij JP, Stepp CE. Voice relative fundamental frequency via neck-skin acceleration in individuals with voice disorders. *J Speech Lang Hear Res* 2015;58(5):1482–1487. PMID: PMC4686308.
17. **Mehta DD**, Van Stan JH, Zañartu M, Ghassemi M, Guttag JV, Espinoza VM, Cortés JP, Cheyne HA, Hillman RE. Using ambulatory voice monitoring to investigate common voice disorders: Research update. *Frontiers in Bioengineering and Biotechnology* 2015;3(155):1–14. PMID: PMC4607864.
18. **Mehta DD**, Van Stan JH, Hillman RE. Relationships between vocal function measures derived from an acoustic microphone and a subglottal neck-surface accelerometer. *IEEE/ACM Trans Audio Speech Lang Processing* 2016;24(4):659–668. PMID: PMC4607864.

19. Powell ME, Deliyski DD, Zeitels SM, Burns JA, Hillman RE, **Mehta DD**. Comparison of videostroboscopy to stroboscopy derived from high-speed videoendoscopy for evaluating patients with vocal fold mass lesions. *Am J Speech Lang Pathol* 2016;25(4):576–589. PMID: PMC5373695.
20. **Mehta DD**, Cheyne II HA, Wehner A, Heaton JT, Hillman RE. Accuracy of self-reported estimates of daily voice use in adults with normal and disordered voices. *J Speech Lang Hear Res* 2016;25(4):576–589. PMID: PMC5373697.
21. Fryd AS, Van Stan JH, Hillman RE, **Mehta DD**. Estimating subglottal pressure from neck-surface acceleration during normal voice production. *J Speech Lang Hear Res* 2016;59(6):1335–1345. PMID: PMC5399761.
22. Ghassemi M, Syed Z, **Mehta D**, Van Stan J, Hillman R, Gutttag J. Uncovering voice misuse using symbolic mismatch. *JMLR Workshop Conf Proc* 2016;56:239–252. PubMed Central – In Process.
23. Van Stan JH, **Mehta DD**, Petit R, Sternad D, Muise J, Burns JA, Hillman RE. Integration of motor learning principles into real-time ambulatory voice biofeedback and example implementation via a clinical case study with vocal fold nodules. *Am J Speech Lang Pathol* 2017;26(1):1–10. PMID: PMC5533549.
24. Van Stan JH, **Mehta DD**, Sternad D, Petit R, Hillman RE. Ambulatory voice biofeedback: Relative frequency and summary feedback effects on performance and retention of reduced vocal intensity in the daily lives of participants with normal voices. *J Speech Lang Hear Res* 2017;60(4):853–864. PMID: PMC5548081.
25. Heller Murray ES, Lien Y-AS, Van Stan JH, **Mehta DD**, Hillman RE, Pieter Noordzij J, Stepp CE. Relative fundamental frequency distinguishes between phonotraumatic and non-phonotraumatic vocal hyperfunction. *J Speech Lang Hear Res* 2017;60(6):1507–1515. PMID: PMC5544410.
26. Espinoza VM, Zañartu M, Van Stan JH, **Mehta DD**, Hillman RE. Glottal aerodynamic measures in adult females with phonotraumatic and nonphonotraumatic vocal hyperfunction. *J Speech Lang Hear Res* 2017;60(8): 2159–2169. PMID: PMC5829799.
27. Brockmann-Bauser M, Bohlender JE, **Mehta DD**. Acoustic perturbation measures improve with increasing vocal intensity in individuals with and without voice disorders. *J Voice* 2018;32(2): 162–168. PMID: 28528786.
28. Chien Y-R, **Mehta DD**, Guðnason J, Zañartu M, Quatieri TF. Evaluation of glottal inverse filtering algorithms using a physiologically based articulatory speech synthesizer. *IEEE/ACM Trans Audio Speech Lang Processing* 2017;25(8):1718–1730. PubMed Central – In Process.
29. Van Stan JH, Maffei M, Masson MLV, **Mehta DD**, Burns JA, Hillman RE. Self-ratings of vocal status in daily life: Reliability and validity for patients with vocal hyperfunction and a normative group. *American Journal of Speech-Language Pathology* 2017;26(4):1167–1177. PMID: PMC5945061.

30. Lien Y-AS, Murray ESH, Calabrese CR, Michener CM, Van Stan JH, Mehta DD, Hillman RE, Noordzij JP, Stepp CE. Validation of an algorithm for semi-automated estimation of voice relative fundamental frequency. *Annals of Otology, Rhinology, and Laryngology* 2017;126(10):712–716. PMID: PMC6063362.
31. McKenna VS, Llico AF, Mehta DD, Perkell JS, Stepp CE. Magnitude of neck-surface vibration as an estimate of subglottal pressure during modulations of vocal effort and intensity in healthy speakers. *Journal of Speech, Language, and Hearing Research* 2017;60(12):3404–3416. PMID: PMC6111520.
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33. Borsky M, **Mehta DD**, Van Stan JH, Gudnason J. Modal and non-modal voice quality classification using acoustic and electroglottographic features. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* 2017;25(12):2281–2291. PubMed Central – In Process.
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Narrative Report

Introduction

I am a trained speech and hearing scientist and electrical engineer specializing in interdisciplinary research for clinical voice and speech assessment. I completed my doctoral training in the Harvard-MIT Division of Health Sciences and Technology and pursued postdoctoral research at the Harvard School of Engineering and Applied Sciences and MGH Center for Laryngeal Surgery and Voice Rehabilitation. Currently, I am Assistant Investigator at MGH and Assistant Professor at HMS. As Director of Voice Science and Technology Laboratory at the MGH Voice Center, my effort is split between research investigation and graduate student supervision.

Area of Excellence: Investigation

I play significant research roles in multi-year NIH-funded projects (R01, R21/R33) and am establishing independent lines of investigation through funding from the American Speech-Language-Hearing Association (ASHA), NIH Small Business Initiative Research, and NIH Early Career Research R21 Award. My principle scientific contributions are investigations into the clinical efficacy of high-speed imaging and wearable sensors with an emphasis on voice disorder assessment through a detailed characterization of voice physiology. The overall goal of these lines of research is to guide future development of improved phonosurgical techniques and voice therapy paradigms with clinically salient imaging and noninvasive, ambulatory sensors.

I actively collaborate with international colleagues in Chile, Iceland, and Switzerland to produce several publications spanning engineering, medical, and scientific disciplines. I currently focus on translating three-dimensional vocal fold imaging technologies to clinical practice and leading the design and development of a smartphone-based ambulatory voice monitor to study behaviorally based voice disorders. As a consultant at MIT Lincoln Laboratory, I provide critical technical expertise in signal processing to projects investigating the effects of neurological disorders on speech and voice health. I have served nationally on ASHA committees and locally in the Harvard DMS Speech and Hearing Bioscience and Technology (SHBT) program. I also serve as a reviewer for several prominent journals in science, engineering, and medicine. In November 2015, I received the prestigious Award for Early Career Contributions in Research presented by ASHA that recognizes outstanding early-stage investigators.

Teaching and Education

I provide advisory support to laryngology fellows at the MGH Voice Center and supervise and teach doctoral students in the Harvard SHBT program. I have taught coursework at the graduate level over a wide range of topics, including signal processing, acoustic phonetics, and anatomy and physiology of voice and speech production. As Adjunct Assistant Professor at the MGH Institute of Health Professions, I actively supervise and mentor graduate thesis research by master's and doctoral students in speech-language pathology. I am invited often to give presentations at academic institutions, society meetings, and conferences.

Summary

Since my appointment as Assistant Professor at HMS, I have striven to conduct high-quality clinical and basic research, to teach and mentor the next generation, and to collaborate with the best scientists and engineers in the field of clinical voice and speech assessment. Through my lecturing, written work, and involvement with professional societies, I have sought to improve clinical care for patients who have been diagnosed with voice and speech disorders.

