Thomas F Quatieri Long Curriculum Vita

Thomas F Quatieri
Senior Scientist, Human Health and Performance Group, MIT Lincoln Laboratory
Faculty, Speech and Hearing Bioscience and Technology Program, Harvard Medical School
Adjunct Professor, MGH Institute of Health Professions
Lurie Faculty Associate, Massachusetts General Brigham
quatieri@ll.mit.edu

## Education

Massachusetts Institute of Technology, Cambridge, MA
Department of Electrical Engineering and Computer Science

- Doctor of Science in Electrical Engineering (Minor in Mathematics) — 1979; Advisor: Professor Alan Oppenheim
- Electrical Engineer Degree — 1977
- Master of Science (Thesis) — 1975; Advisor: Professor Russell Mersereau

Tufts University, Medford, MA
Department of Electrical Engineering

- Bachelor of Science in Electrical Engineering — 1973; Summa Cum Laude

## Honors, Awards, and Special Recognition

- 2023: Life Fellow of IEEE; 1999, Fellow of the IEEE for: 'Contributions to sinusoidal speech and audio modeling and nonlinear signal processing'
- 2023: MIT Lincoln Laboratory Outstanding Mentor Award
- 2022: DARPA Embedded Entrepreneur Initiative award to support speech research translation
- 2018: A best poster award at the Movement and Cognition Conference, Harvard Medical School; see publications/abstracts
- 2015: R&D 100 Award Finalist for Vocal Biomarkers for Depression
- 2013, 2014: Led MIT Lincoln Laboratory teams that won the AVEC Depression Recognition Challenges; see publications/conference papers
- 2010: MIT Lincoln Laboratory Best Paper Award; see publications/journal papers
- 1995: IEEE W.R.G. Baker Prize Award ('most outstanding paper reporting original work in any of the 1995 IEEE Transactions, Journals, Magazines, or Proceedings'); see publications/journal papers


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- 1994: IEEE Signal Processing Society's Senior Award (society's best journal paper award); see publications/journal papers
- 1990: IEEE Signal Processing Society's Senior Award (society's best journal paper award); see publications/journal papers
- 1982: Paper Award of the IEEE Signal Processing Society (society's best journal paper award by author under age 30); see publications/journal papers
- MIT Lincoln Laboratory Team Awards
    - Team Member; 2024 Award for Health Readiness and Performance System (HRAPS) development
    - Team Leader; 2015 Award for Vocal and Facial Biomarkers
    - Team Member; 2004 Award for Speech Research and Technology Transfer

## Positions

- 2012– Present: Senior Scientist, Human Health and Performance Systems group, MIT Lincoln Laboratory
- 2024–Present: Adjunct Professor, Massachusetts General Hospital (MGH) Institute for Health Professions
- 2023–Present: Faculty Associate, Massachusetts General Brigham (MGB) Lurie Center for Autism
- 2006–2017: Faculty Appointment in Harvard-MIT Health, Science, and Technology (HST) Division
- 2001–Present: Faculty Appointment in Harvard–MIT Speech and Hearing Bioscience and Technology (SHBT) Program under Harvard Medical School (previously under HST)
- 1990–2004: Lecturer of MIT graduate course Digital Speech Processing
- 1983–2011: Member of the Human Language Technology Group, MIT Lincoln Laboratory
- 1980–1983: Member of Sensor Processing Technology Group, MIT Lincoln Laboratory

## Scientific Appointments, Professional Memberships, and Service

- Elected to IEEE Fellow 1999
    - Promoted to IEEE Life Fellow 2022
- Associate Editor for Computers, Speech, and Language 2014–Current
- Associate Editor for IEEE Trans on Signal Processing 1993–1997
- Member of IEEE James L. Flanagan Speech and Audio Processing Award Committee 2010–2013
- Member of IEEE Speech and Language Processing Technical Committee ~2008–2011

- Member of IEEE Digital Signal Processing Technical Committee ~1984–1996

- Member of the steering committee for the biannual Digital Signal Processing Workshop (Proceedings Chair) 1983–1992

- Member of the steering committee of the bi-annual IEEE Workshop on Applications of Signal Processing to Audio and Acoustics. (Proceedings Chair) ----------

- Member of organizing committee of 7th Workshop on Speech and Language Processing for Assistive Technologies 2016

- MIT Lincoln Laboratory Neuroscience and Neuromimetics Seminar Series: Cofounder 2023–2024
  Co-led the inviting of leaders in the neural science field to foster learning and internal and external collaboration

- Voice Quality Study Group: Co-Founder 2005–2009
  Co-led a biweekly study group at MIT to bring together students and faculty from engineering, speech science, and the clinic to discuss and host guest researchers in voice quality analysis

- NIH Grant Review Panels 2013, 2016

- NSF Study Workshop Panel 2015 (May 7–8)
  Panel of 16 leading speech researchers led by Prof Abeer Alwan):
  Role of Speech in Developing Robust Speech Processing Applications,
  NSF, Arlington, VA; Final report: Alwan A, …. Quatieri T … (16 co-authors)

- NSF Grant Review Panel 2022

- **Session Chair (partial list)**

- Session Chair for IEEE Appl. Signal Processing to Audio and Acoustic Workshop 1993
- Session Chair for IEEE Appl. Signal Processing to Audio and Acoustic Workshop 1997
- Session Chair for IEEE Int. Conf. on Acoustics, Speech, and Signal Processing 2004
- Session Chair for IEEE Int. Conf. on Acoustics, Speech, and Signal Processing 2005
- Session Chair for Int. Conf. on Spoken Language Processing 2007
- Session Chair in other years for various IEEE/other conferences ------

- **Interspeech Conference Activities (partial list)**

  - Session Chair for Interspeech 2013
  - Session Co-chair for Interspeech 2016
  - Other Interspeech Session Co-Chair and Chair positions -------
  - Interspeech tutorial on Depression and Suicide Risk Assessment 2015
    (with N. Cummins, S. Scherer, J. Krajewski, S, Schnieder, J. Epps,)

- **Organizing Committees for Interspeech Special Sessions**

  - Speech and Language in Health: From Remote Monitoring to Medical Conversations 2022, 2023, 2024
  - Clinical and Neuroscience-Inspired Vocal Biomarkers of Neurological and Psychiatric Disorders 2016

- **Conference/Workshop Reviewer (partial list)**

  - Interspeech; ICASSP; JSLHR; ACII Affective Computing; IEEE Body Sensor Network; IEEE workshop Appl. of Signal Proc to Audio and Acoustics 1979–present

- **Journal Reviewer (partial list)**

  - Computer, Speech and Language; JASA; Frontiers (Neuroscience, Psychiatry, Digital Health); IEEE Trans Audio, Speech and Signal Processing; IEEE Trans Signal Processing; IEEE Speech and Audio; IEEE Signal Processing Letters; IEEE Trans. Image Processing; Speech Communications; ICSLP; Electronics Letters; Speech Communications; IEEE Proceedings 1979–present

- Mentor in MIT Lincoln Laboratory Career Mentoring Program 2024–current
- Member of MIT Lincoln Laboratory Biomedical Committee ~2012–2020
- Member of MIT Lincoln Laboratory Professional Societies Committee 2023–current
- Member of Defense Health Agency panel on Traumatic Brain Injury Assessment Guidelines 2025–current
- Member of Tau Beta Pi, Eta Kappa Nu, Sigma Xi, Acoustical Society of America, Society for Neuroscience, International Speech Communication Association, IEEE Signal Processing Society, Association for Research in Otolaryngology, International Society for Autism Research

## Publications

### Books

1. **T.F. Quatieri,** *Discrete-Time Speech Signal Processing: Principles and Practice*. Prentice Hall, 781 pages, 2001.

### Book Chapters

1. R.M. Mersereau, W.F.G. Mecklenbrauker, and **T.F. Quatieri**, Two-Dimensional Digital Signal Processing, in *Benchmark Papers in Electrical and Computer Science*, Edited by S.K. Mitra and M.P. Ekstrom, Dowden, Hutchingson, and Ross, Inc., Stroudsburg, Pennslyvania, 1978. Includes paper: McClellan Transformations for Two-Dimensional Digital Filtering: Part 1-Design, reprinted from IEEE Trans. Circuits Syst., CA-23 (7), pp. 405-414, 1976.

2. A.V. Oppenheim, J.M. Tribolet, and **T.F. Quatieri**, Chapter 7: Cepstral and Homomorphic Analysis, in *Programs for Digital Signal Processing*, IEEE Press, Edited by Digital Signal Processing Committee, pp. 7.1.1-7.2.6, 1979.

3. S.H. Nawab and **T.F. Quatieri**, Chapter 4: Short-Time Fourier Transform, in *Advanced Topics in Signal Processing*, ed. J.S. Lim and A.V. Oppenheim, Prentice Hall, pp. 289-337, Oct. 1987.

4. R.J. McAulay and **T.F. Quatieri**, Chapter 2: Low-Rate Speech Coding Based on the Sinusoidal Speech Model in *Advances in Speech Signal Processing*, ed. S. Furui and M.M. Sondhi, Marcel Dekker, pp. 165-208, Oct. 1991.

5. R.J. McAulay, T. Parks, **T.F. Quatieri**, and M. Sabin, Chapter 19: Sine-Wave Amplitude Coding at Low Data Rates, in *Advances in Speech Coding,* ed. B.S. Atal, V. Cuperman, A. Gersho, Kluwer Academic Publishers, pp. 203-214, 1991.

6. T.G. Champion, R.J. McAulay and **T.F. Quatieri***,* Chapter 16: Multirate STC and its Application to Multi-Speaker Conferencing, in S*peech Audio Coding for Wireless and Network Applications,* Kluwer Academic Publishers, pp. 127-133, 1993.

7. R.J. McAulay and **T.F. Quatieri***,* Chapter 4: Sinusoidal Coding, in *Speech Coding and Synthesis*, ed. B. Klein and K. Paliwal, Elsevier, pp. 121-170, Dec. 1996.

8. **T.F. Quatieri** and R.J. McAulay, Chapter 9: Audio Signal Processing Based on Sinusoidal Analysis/Synthesis, in *Application of DSP to Audio and Acoustics*, ed. M. Kahrs and G. Brandenberg, Kluwer, Boston, MA, pp. 343-411, 1998.

9. **T.F. Quatieri**, J.R. Williamson, C.J. Smalt, J. Perricone, T. Patel, L. Brattain, J. Palmer, K. Heaton, M. Eddy, and J. Moran, Multimodal biomarkers to discriminate cognitive state, chapter in *The Role of Technology in Clinical Neuropsychology*, eds. R.L Kane and T.D. Parsons, NY: Oxford University Press, 2017.

10. B.A. Telfer, **T.F. Quatieri.F.,** H.M. Rao, J.S. Palmer, Wearable Technology in Extreme Environments. Chapter in: *Engineering and Medicine in Extreme Environments*, ed. T. Cibis, A.M. McGregor, Springer, Cham, 2022.

**Papers in Refereed Journals**

1. R.M. Mersereau, W.F.G. Mecklenbrauker, and **T.F. Quatieri,** McClellan Transformations for Two Dimensional Digital Filtering: Part 1- Design, *IEEE Trans. Circuits Syst*., CA-23 (7), pp. 405-414, 1976.

2. **T.F. Quatieri,** Short-Time Spectral Analysis with the Conventional and Sliding CZT, *IEEE Transactions on Acoustics, Speech, and Signal Processing*, Vol. ASSP-26, No. 6, Dec., pp. 561-566, 1978.

3. **T.F. Quatieri,** Minimum and Mixed Phase Speech Analysis-Synthesis by Adaptive Homomorphic Deconvolution, *IEEE Transactions on Acoustics, Speech, and Signal Processing*, Vol. ASSP-27, No. 4, Aug., pp. 328-335, 1979.

4. **T.F. Quatieri,** Recursive Two-Dimensional Signal Reconstruction from Linear System Input and Output Magnitudes, *Proceedings of the IEEE*, Vol. 69, No. 5, May, pp. 667-668, 1981.

5. V.T. Tom, **T.F. Quatieri,** M.H. Hayes, and J.H. McClellan., Convergence of Iterative Nonexpansive Signal Reconstruction Algorithms, *IEEE Transactions on Acoustics, Speech, and Signal Processing*, Vol. ASSP-29, No. 5, Oct., pp. 1052-1058, 1981.

6. **T.F. Quatieri** and A.V. Oppenheim, Iterative Techniques for Minimum Phase Signal Reconstruction from Phase or Magnitude, *IEEE Transactions on Acoustics, Speech, and Signal Processing*, Vol. ASSP-29, No. 6, Dec., pp. 1187-1193, 1981.

7. **T.F. Quatieri** and D.E. Dudgeon, Implementation of 2-D Digital Filters by Iterative Methods, *IEEE Transactions on Acoustics, Speech, and Signal Processing*, Vol. ASSP-30, No. 3, June, pp. 473-487, 1982. (*IEEE 1982 Signal Processing society's best journal paper award by author under age 30).

8. N.S. Hamid, **T.F. Quatieri,** and J.S. Lim, Signal Reconstruction from Short-Time Fourier Transform Magnitude, *IEEE Transactions on Acoustics, Speech, and Signal Processing*, Vol. ASSP-31, No. 4, Aug., pp. 986-998, 1983.

9. **T.F. Quatieri,** S.H. Nawab, and J.S. Lim, Frequency Sampling of the Short-Time Fourier-Transform Magnitude for Signal Reconstruction, *Journal of the Optical Society of America*, Vol. 73, Nov., pp. 1523-1526, 1983.

10. M. Hayes and **T.F. Quatieri**, Recursive phase retrieval using boundary conditions, *Journal of the Optical Society of America*, 73, pp. 1427–1433, 1983.

11. **T.F. Quatieri** and R.J. McAulay, Speech Transformations Based on a Sinusoidal Representation, *IEEE Trans. Acoustics, Speech, and Signal Processing*, Vol. ASSP-34, No. 6, Dec., pp. 1449-1464, 1986.

12. R.J. McAulay and **T.F. Quatieri**, Speech analysis/Synthesis based on a sinusoidal representation, *IEEE Transactions on Acoustics, Speech, and Signal Processing*, vol. 34, no. 4, Aug. pp. 744-754, 1986. (*IEEE 1986 Signal Processing Society's best journal paper award).

13. C.W. Therrien, **T.F. Quatieri** and D.E. Dudgeon, Statistical model-based algorithms for image analysis, *Proceedings of the IEEE*, vol. 74, no. 4, April, pp. 532-551, 1986.

14. **T.F. Quatieri** and G.C. O'Leary, Far-Echo Cancellation in the Presence of Frequency Offset, *IEEE Transactions on Communications*, Vol. 37, No. 6, June, pp. 635-644, 1989.

15. **T.F. Quatieri** and R.G. Danisewicz, An Approach to Co-channel Talker Interference Suppression Using a Sinusoidal Model for Speech, *IEEE Trans. Acoustics, Speech, and Signal Processing*, Vol. 38, No. 1, Jan., pp. 56-69, 1990.

16. **T.F. Quatieri** and R.J. McAulay, Peak-to-RMS Reduction of Speech Based on a Sinusoidal Model, *IEEE Trans. Acoustics, Speech, and Signal Processing*, Vol. 39, No. 2, Feb., pp. 273-289, 1991.

17. **T.F. Quatieri** and R.J. McAulay, Shape-Invariant Time-Scale and Pitch Modification of Speech, *IEEE Trans. Acoustics, Speech, and Signal Processing*, Vol. 40, No. 3, March, pp. 497-510, 1992.

18. P. Maragos, J. Kaiser, and **T.F. Quatieri,** Energy Separation in Signal Modulations with Application to Speech Analysis, *IEEE Trans. Signal Processing*, Vol. 41, No. 10, Oct., pp. 3024-3051, 1993 . (*Two awards: 1. IEEE 1994 Signal Processing Society's best journal paper award and 2. 'most outstanding paper reporting original work in any of the 1995 IEEE Transactions, Journals, Magazines, or Proceedings').

19. P. Maragos, J.F. Kaiser and **T.F. Quatieri**, On amplitude and frequency demodulation using energy operators, *IEEE Transactions on Signal Processing*, vol. 41, no. 4 April, pp. 1532-1550, 1993.

20. **T.F. Quatieri,** C.R. Jankowski, and D.A. Reynolds, Energy Onset Times for Speaker Identification, *IEEE Signal Processing Letters*, Vol. 1, No. 11, Nov., pp. 160-162, 1994.

21. **T.F. Quatieri,** R.B. Dunn, and T.E. Hanna, A Subband Approach to Time-Scale Modification of Complex Acoustic Signals, *IEEE Trans. Speech and Audio Processing*, Vol. 3, No. 6, Nov., pp. 515-519, 1995.

22. **T.F. Quatieri**.E. Hanna, and G.C. O'Leary, AM-FM Separation Using Auditory-Motivated Filters, *IEEE Transactions on Speech and Audio*, Sept., pp. 465-480, 1997.

23. M.D. Plumpe, **T.F. Quatieri**, and D.A. Reynolds, Modeling of the Glottal Flow Derivative Waveform with Application to Speaker Identification, *IEEE Transactions on Speech and Audio Processing*, Sept., 1999.

24. W.P. Torres and **T.F. Quatieri,** Estimation of Modulation Based on FM-to-AM transduction: Two Sinusoidal Case, *IEEE Transactions on Signal Processing*, Vol. 47, No. 11, Nov., pp. 3084-3097, 1999.

25. D.A. Reynolds, **T.F. Quatieri**, and R.B. Dunn, Speaker Verification Using Adapted Gaussian Mixture Models, *Digital Signal Processing Review Journal*, Jan., 2000.

26. R.B. Dunn, D.A. Reynolds, and **T.F. Quatieri**, Approaches to Speaker Detection and Tracking in Conversational Speech, *Digital Signal Processing Review Journal*, Jan., 2000.

27. **T.F. Quatieri**, D.A. Reynolds, and G.C. O'Leary, G. C., Estimation of handset nonlinearity with application to speaker recognition, *IEEE Transactions on Speech and Audio Processing*, Vol. 8, No. 5, Sept., 2000.

28. **T.F. Quatieri**, K. Brady, D. Messing, J.P. Campbell, W. Campbell, M. Brandstein, C.J. Weinstein, J. Tardelli, and P. Gatewood, Exploiting nonacoustic sensors for speech encoding, *IEEE Transactions on Speech and Audio Processing*, accepted, March 2006.

29. N. Malyska, and **T.F. Quatieri**, Spectral representations of nonmodal phonation, *IEEE Transactions on Audio, Speech, and Language Processing*, Jan. 2008.

30. T.T. Wang, and **T.F. Quatieri**, High-Pitch Formant Estimation by Exploiting Temporal Change of Pitch, *IEEE Transactions on Audio, Speech, and Language Processing*, Vol. 18, No. 2, Jan. 2010. (*2010 MIT Lincoln Laboratory Best Paper Award).

31. D.D. Mehta, D.D. Deliyski, S.M. Zeitel, **T.F. Quatieri**, and R.E. Hillman, Voice Production Mechanisms Following Phonosurgical Treatment of Early Glottic Cancer, Annals of Otology, *Rhinology & Laryngology,* 119(1):1-9, Annals Publishing Company, 2010.

32. D. Mehta, M. Zañartu, **T.F. Quatieri**, D.D. Deliyski, and R.E. Hillman, Investigating acoustic correlates of human vocal fold phase asymmetry through mathematical modeling and laryngeal high-speed videoendoscopy, *J. Acoust. Soc. Am*., Vol. 130(6), pp. 3999-4009, 2011.

33. D. Rudoy, **T.F. Quatieri**, and P. Wolfe, Time-Varying Autoregressions in Speech: Detection Theory and Applications, *IEEE Transactions on Speech, Audio, and Language Processing*, 2011.

34. D.D. Mehta, D.D. Deliyski, **T.F. Quatieri**, and R.E. Hillman, Automated measurement of vocal fold vibratory asymmetry from high-speed videoendoscopy recordings, *Journal of Speech, Language, and Hearing Research*, 54, 47–54, 2011.

35. A. Trevino, **T.F. Quatieri**, and N. Malyska, Phonologically-Based Biomarkers for Major Depressive Disorder, *EURASIP Journal on Advances in Signal Processing: Special Issue on Emotion and Mental State Recognition from Speech*, Aug. 2011.

36. T. Wang, and **T.F. Quatieri,** Two-dimensional speech signal modeling, *IEEE Transactions on Audio, Speech and Language Processing*, vol 20, Aug., pp 1843-1856, 2012.

37. T. Wang, and **T.F. Quatieri**, Toward interpretive models for 2-D processing of speech, *IEEE Transactions on Audio, Speech and Language Processing*, vol. 20, no. 7, Sept., pp. 2159-2173, 2012.

38. N. Cummins, S. Scherer, J. Krajewski, S. Schnieder, J. Epps, J., and **T.F. Quatieri**, A review of depression and suicide risk assessment using speech analysis, *Speech Communication*, Vol. 17, July, Pages 10–49, 2015.

39. Y.-R. Chien, D.D. Mehta, J. Guðnason, M. Zañartu, and **T.F. Quatieri**, Evaluation of glottal inverse filtering algorithms using a physiologically based articulatory speech synthesizer. *IEEE/ACM Transactions on Audio Speech Language Processing*, 25(8), 2017.

40. V. Tepe, C. Smalt, J. Nelson, **T.F. Quatieri**, and K. Pitts, Hidden hearing injury: The emerging science and military relevance of cochlear synaptopathy. *Military Medicine*, 182(9), 2017.

41. A.C. Lammert, C.H. Shadle, S.S. Narayanan, and **T.F. Quatieri**, Speed-accuracy tradeoffs in human speech production, *PLoS ONE,* 13(9), Sept. 2018.

42. B. Yu, J. Williamson, J. Mundt, and **T.F. Quatieri**, Speech-Based Automated Cognitive Impairment Detection from Remotely-Collected Cognitive Test Audio, *IEEE Access*, pp. 1-1, 2018.

43. T. Hickman, C. Smalt, J. Bobrow, **T.F. Quatieri**, and M. Liberman, Blast-induced cochlear synaptopathy in chinchillas. *Nature Scientific Reports*, 8(1):10740, 2018.

44. G. Ciccarelli, M. Nolan, J. Perricone, P.T. Calamia, S. Haro, J. O'Sullivan, N. Mesgarani, **T.F. Quatieri**, and C.J. Smalt, Comparison of Two-Talker Attention Decoding from EEG with Nonlinear Neural Networks and Linear Methods, *Nature Scientific Reports*, 9(1):11538, 2019.

45. B. Parrell, A. Lammert, G. Ciccarelli, and **T.F. Quatieri**, Current Models of Speech Motor Control: A Control-Theoretic Overview of Architectures & Properties, *The Journal of the Acoustical Society of America*, 145(3), 2019.

46. J.R. Williamson, D. Young, A.A. Nierenberg, J. Niemi, B.S. Helfer, and **T.F. Quatieri,** Tracking depression severity from audio and video based on speech articulatory coordination. *Computer Speech & Language*, 55, 40-5, 2019.

47. A.C. Lammert, J. Melot, D.E. Sturim, D.J. Hannon,R. DeLaura, J.R. Williamson, G. Ciccarelli, and **T.F. Quatieri**, Analysis of Phonetic Balance in Standard English Passages, *J Speech Lang Hear Res*,. 27;63(4) Apr, pp. 917-930, 2020.

48. H.M. Rao, T. Talkar, G. Ciccarelli, M. Nolan, A. O'Brien, G. Vergara-Diaz, D. Sherrill, R. Zafonte, J.S. Palmer, **T.F. Quatieri**, R.J. McKindles, P. Bonato, and A.C. Lammert, Sensorimotor conflict tests in an immersive virtual environment reveal subclinical impairments in mild traumatic brain injury, *Nature Scientific Reports*, Sep 8;10(1):14773, 2020.

49. T. Talkar, J.R. Williamson, D. Hannon, H. Rao, S. Yuditskaya, D. Sturim, K. Claypool, L. Nowinski, H. Saro, C. Stamm, M. Mody, C. McDougle, and **T.F. Quatieri**, Assessment of Speech and Fine Motor Coordination in Children with Autism Spectrum Disorder, *IEEE Access,* vol. 8, pp. 127535–127545, 2020.

50. H. Rao, C. Smalt, A. Rodriguez, H.M. Wright, D. Mehta, L.J. Brattain, H.M. Edwards, A. Lammert, K.J. Heaton, and **T.F. Quatieri**, Predicting cognitive load and operational performance in a simulated marksmanship task, *Frontiers in Human Neuroscience*, 14, 2020.

51. K.J. Heaton, J.R. Williamson, A.C. Lammert, K.R. Finkelstein, C.C. Haven, D. Sturim, and **T.F. Quatieri**, Predicting changes in performance due to cognitive fatigue: A multimodal approach based on speech motor coordination and electrodermal activity, *The Clinical Neuropsychologist*, 34(6), 1190-1214, 2020.

52. **T.F. Quatieri**. Talkar, and J. Palmer, A Framework for Biomarkers of COVID-19 Based on Coordination of Speech-Production Subsystems. *IEEE Open J. Eng. Med. Biol.*, 2020.

53. C.P. Adans-Dester, … **T.F. Quatieri**, … and P. Bonato, Can mHealth Technology Help Mitigate the Effects of the COVID-19 Pandemic?, *IEEE Open Journal of Engineering in Medicine and Biology*, vol. 1, pp. 243-248, 2020.

54. S. Haro, C.J. Smalt, G.A. Ciccarelli, and **T.F. Quatieri**, Deep neural network model of hearing-impaired speech-in-noise perception, *Frontiers in Auditory Cognitive Neuroscience*, 14, 2020.

55. N.Cummins, V. Sethu, J. Epps, J.R. Williamson, **T.F. Quatieri,** and J. Krajewski, Generalized Two-Stage Rank Regression Framework for Depression Score Prediction from Speech, *IEEE Transactions on Affective Computing*, vol. 11, no. 2, pp. 272-283, 1 April-June 2020.

56. C.J. Smalt, P.T. Calamia, A.P, Dumas, J.P. Perricone, T. Patel, J. Bobrow, J.Collins, M.L. Markey, **T.F. Quatieri,** The effect of hearing-protection devices on auditory situational awareness and listening effort, *Ear and Hearing*, 41(1), 82–94, 2020.

57. B.J. Borgstrom, M.S. Brandstein, G.A. Ciccarelli, **T.F. Quatieri**, and C.J. Smalt, Speaker separation in realistic noise environments, with applications to a cognitively controlled hearing aid, *Neural Networks*, 2021.

58. J.R. Williamson, D. Sturim, T. Vian, J. Lacirignola, T.E. Shenk, S. Yuditskaya, H.M. Rao, T.M. Talavage, K.J. Heaton, and **T.F. Quatieri**, Using Dynamics of Eye Movements, Speech Articulation and Brain Activity to Predict and Track mTBI Screening Outcomes, *Frontiers in Neurolog,*. 2021.

59. H.M. Rao, S. Yuditskaya, J.R. Williamson, T.R. Vian, J.J. Lacirignola, T.E. Shenk, T.M. Talavage, K.J. Heaton, and **T.F. Quatieri**, Using Oculomotor Features to Predict Changes in Optic Nerve Sheath Diameter and ImPACT Scores From Contact-Sport Athletes, *Frontiers in Neurology*, 2021.

60. S. Haro, H. Rao, **T.F. Quatieri**, and C. Smalt, EEG Alpha Power and Pupil Diameter Reflect Endogenous Auditory Attention Switching and Listening Effort, *European Journal of Neuroscience*, 2022.

61. V. Ramanarayanan, A.C. Lammert, H.P. Rowe, **T.F. Quatieri**, and J.R. Green, Speech as a biomarker: opportunities, interpretability, and challenges, *Perspectives of the ASHA Special Interest Groups*, 7(1), 276-283, 2022.

62. J. Narain, K. T. Johnson, **T. F. Quatieri**, R. W. Picard and P. Maes, Modeling Real-World Affective and Communicative Nonverbal Vocalizations from Minimally Speaking Individuals, *IEEE Transactions on Affective Computing*, Vol. 13, no. 4, Oct.-Dec., pp. 2238-2253, 2022.

63. M. Husain, A. Simpkin, C. Gibbons, T. Talkar, D.M. Low, P. Bonato, S. Ghosh, **T.F. Quatieri**, and D.T. O'Keeffe, Artificial Intelligence for Detecting COVID-19 with the Aid of Human Cough, Breathing and Speech Signals: Scoping Review, *IEEE Open Journal of Engineering in Medicine and Biology*, 2022.

64. **T.F. Quatieri**, J. Wang, J.R. Williamson, R. DeLaura, T. Talkar, N.P. Solomon, S.E. Kuchinsky, M. Eitel, T. Brickel, S. Lippa, K.J. Heaton, D.S. Brungart, L. French, R. Lange, J. Palmer, and H. Reynolds, An Emotion-Driven Vocal Biomarker-Based PTSD Screening Tool, *IEEE Open Journal of Engineering in Medicine and Biol*ogy, Vol. 13, No. 5, June, pp. 621-626, 2023.

65. T. Talkar, D.M. Low, A.J. Simpkin, S. Ghosh, D.T. O'Keeffe, and **T.F. Quatieri**, Dissociating COVID-19 from other respiratory infections based on acoustic, motor coordination, and phonemic patterns, *Nature/Science Rep*, Vol. 13, 1567, 2023.

66. K. Johnson, J. Narain, **T.F. Quatieri**, P. Maes, and R. Picard, ReCANVo: A database of real-world communicative and affective nonverbal vocalizations, *Nature Scientific Data*, 2023.

67. T. Talkar, K.T. Johnson, J. Narain, A. O'Brien, P. Maes, R.W. Picard, and **T.F. Quatieri**, Quantifying Speech Production Coordination from Non- and Minimally-Speaking Individuals, *Journal of Autism and Developmental Disorders*, 2024.

68. T. Talkar, J.R. Williamson, S. Yuditskaya, D.J. Hannon, H.M. Rao, L. Nowinski, H. Saro, M. Mody, C.J. McDougle, and **T.F. Quatieri**, An exploratory characterization of speech- and fine-motor coordination in verbal children with Autism spectrum disorder, *Computer Speech & Language*, Vol. 89, 2024.

**Papers in Proceedings of Refereed Conferences**

1. J.M. Tribolet, **T.F. Quatieri**, and A.V. Oppenheim, "Short-Time Homomorphic Analysis", in Proc. of IEEE Int. Conf. on Acoustics, Speech, and Signal Processing, Hartford, Conn., May 1977, pp. 716-722.

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123. R. Horwitz-Martin, **T.F. Quatieri**, E. Godoy, and J.R. Williamson, "A vocal modulation model with application to predicting depression severity", in IEEE Body Sensor Network Conference, BSN, 2016.

124. R. Horwitz-Martin, **T.F. Quatieri,** A. Lammert, J.R. WIlliamson, Y. Yunusova, E. Godoy, D.D. Mehta, J. Green, "Relation of automatically extracted formant trajectories with intelligibility loss and speaking rate decline in amyotrophic lateral sclerosis", in Proceedings of INTERSPEECH; San Francisco, CA, 2016.

125. L.J. Brattain, R. Landman, K.A. Johnson, P. Chwalek, J. Hyman, J. Sharma, C. Jennings, R. Desimone, G. Feng, and **T.F. Quatieri,** "A multimodal sensor system for automated marmoset behavioral analysis", in 2016 IEEE 13th International Conference on Body Sensor Networks, pp. 254-259, June 2016.

126. E. Godoy, A. Dumas, J. Melot, N. Malyska, **T.F. Quatieri**, "Relating estimated cyclic spectral peak frequency to measured epilarynx length using Magnetic Resonance Imaging", in Interspeech, San Francisco, Sept., 2016.

127. G. Ciccarelli, **T.F. Quatieri**, and S. Ghosh, "Neurophysiological vocal source modeling for biomarkers of disease", Annual Conference of the International Speech Communication Association, 2016.

128. K.M. Smith, J.R. Williamson, **T.F. Quatieri**, "Vocal markers of motor, cognitive, and depressive symptoms in Parkinson's disease", in Proceedings of the 2017 Seventh International Conference on Affective Computing and Intelligent Interaction (ACII); San Antonio, TX, USA, pp. 71–78, 23–26 Oct. 2017.

129. E. Godoy, J.R. WIlliamson, and **T.F. Quatieri**, "Canonical Correlation Analysis and Prediction of Perceived Rhythmic Prominences and Pitch Tones", in Speech. Proc. Interspeech, pp. 3206-3210, 2017.

130. A.C. Lammert, J.R. Williamson, A. Hess, T. Patel, **T.F. Quatieri**, H.J. Liao, A. Lin, K.J. Heaton, "Noninvasive estimation of cognitive status in mild traumatic brain injury using speech production and facial expression", in Seventh International Conference on Affective Computing and Intelligent Interaction (ACII), pp. 105-110, Oct. 2017.

131. D.D. Mehta, P.C. Chwalek, **T.F. Quatieri,** and L.J. Brattain, "Wireless neck-surface accelerometer and microphone on flex circuit with application to noise-robust monitoring of Lombard speech", in Proceedings of INTERSPEECH, 2017.

132. P.C. Chwalek, D.D. Mehta, B. Welsh, C. Wooten, K. Byrd, E. Froelich, D. Mauer, J. Lacirignola, **T.F. Quatieri,** L.J. Brattain, "Lightweight, on-body, wireless system for ambulatory voice and ambient noise monitoring", in Proceedings of the 15$^{th}$ International Conference on Wearable and Implantable Body Sensor Networks; Cambridge, MA, 2018.

133. J.R. Williamson, **T.F. Quatieri**, A.C. Lammert, K. Mitchell, K. Finkelstein, N. Ekon, K. Heaton, "The Effect of Exposure to High Altitude and Heat on Speech Articulatory Coordination", in Interspeech, pp. 297-301, 2018.

134. J. Sloboda, A. Lammert, J.R. WIlliamson, C. Smalt, D.D. Mehta, I. Curry, K. Heaton, J. Palmer, **T.F. Quatieri,** "Vocal biomarkers for cognitive performance estimation in a working memory task", in Proceedings of Interspeech, pp. 1756–1760, 2018.

135. C. Espy-Wilson, S. Lammert, N. Seneviratne, **T.F. Quatieri**, "Assessing neuromotor coordination in depression using inverted vocal tract variables", in Proceedings of the Annual Conference of the International Speech Communication Association, pp. 1448–1452, Interspeech 2019.

136. G. Ciccarelli, D. Mehta, A. Ortiz, J. Van Stan, L. Toles, K. Marks, R. Hillman, **T.F. Quatieri**, “Correlating an ambulatory voice measure to electrodermal activity in patients with vocal hyperfunction”, in Proceedings of the 16th International Conference on Wearable and Implantable Body Sensor Networks; Chicago, IL, 2019.

137. D. Mehta, R. Deshpande, L. Letter, E. Froehlich, A. Siegel, **T.F. Quatieri,** L. Brattain, “On-body monitoring of voice-based cognitive load features in an auditory working memory task”, in Proceedings of the 16th International Conference on Wearable and Implantable Body Sensor Networks; Chicago, IL, 2019.

138. C. Noufi, A. Lammert, J.R. WIlliamson, D.D. Mehta, G. Ciccarelli, D. Sturim, J. Green, T. Campbell, **T.F. Quatieri**, “Vocal biomarker assessment following pediatric traumatic brain injury: A retrospective cohort study”, in Proceedings of Interspeech; Graz, Austria, 2019.

139. N. Seneviratne, A. Lammert, J.R. Williamson, **T.F. Quatieri,** and C. Espy-Wilson, “Extended Study on the Use of Vocal Tract Variables to Quantify Neuromotor Coordination in Depression”, in Proc. Interspeech, 2020.

140. T. Talkar, S. Yuditskaya, J.R. WIlliamson, A.C. Lammert, H. Rao, D. Hannon, A. O’Brien, G. Vergara-Diaz, R. DeLaura, D. Sturim, G. Ciccarelli, R. Zafonte, J. Palmer, P. Bonato, **T.F. Quatieri**, “Detection of Subclinical Mild Traumatic Brain Injury (mTBI) Through Speech and Gait”, in Proc. Interspeech, pp. 135-139. 2020.

141. J. Narain, K.T. Johnson, C. Ferguson, A. O'Brien, T. Talkar, Y.Z. Weninger, P. Wofford, **T.F. Quatieri,** R. Picard, P. Maes, “Personalized Modeling of Real-World Vocalizations from Nonverbal Individuals”, in ICMI '20: Proceedings of the 2020 International Conference on Multimodal Interaction, 2020.

142. Z. Huang, J. Epps, D. Joachim, B. Stasak, J.R. Williamson, **T.F. Quatieri**, H. Meng, B. Xu, T.F. Zheng, “Domain Adaptation for Enhancing Speech-Based Depression Detection in Natural Environmental Conditions Using Dilated CNNs”, in INTERSPEECH, ISCA, pp. 4561–4565, 2020.

143. T. Talkar, N.P. Solomon, D.S. Brungart, S.E. Kuchinsky, M.M. Eitel, S.M. Lippa, T.A. Brickell, L.M. French, R.T. Lange, **T.F. Quatieri**, “Acoustic Indicators of Speech Motor Coordination in Adults With and Without Traumatic Brain Injury”, in Proc. Interspeech, pp. 21-25, 2021.

144. J. Narain, K.T. Johnson, **T.F. Quatieri,** R.W. Picard, P. Maes, “Transfer Learning with Real-World Nonverbal Vocalizations from Minimally Speaking Individuals”, in Workshop in Interpretable ML in Healthcare at International Conference on Machine Learning (ICML), 2021.

145. K.T. Johnson, A. O'Brien, J. Narain, …, T.F. Quatieri, R.W. Picard, "Affective Ratings of Nonverbal Vocalizations Produced by Minimally-Speaking Individuals: What Do Naive Listeners Perceive?", in 2022 10th International Conference on Affective Computing and Intelligent Interaction (ACII), Nara, Japan, pp. 1-8, 2022.

146. T. Talkar, C. Manxhari, J.R. Williamson, K.M. Smith, **T.F. Quatieri**, "Speech Acoustics in Mild Cognitive Impairment and Parkinson's Disease with and without Concurrent Drawing Tasks", in Proc. Interspeech, pp. 2258-2262, 2022.

147. J.R. WIlliamson, E. Godoy, **T.F. Quatieri**, "A Vocal Model to Predict Readiness under Sleep Deprivation", in IEEE Body Sensor Network Conference (BSN), pp. 1-5, 2023.

148. C. Beauchene, S. Haro, M. Brandstein, **T.F., Quatieri**, C.J. Smalt, "Subject-Specific Adaptation for a Causal, Real-time, Auditory-Attention Decoding System", in IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2023.

149. J. Dineley, E. Carr, F. Matcham, J. Downs, R. Dobson, **T.F. Quatieri**, N. Cummins, "Towards robust paralinguistic assessment for real-world mobile health (mHealth) monitoring: an initial study of reverberation effects on speech", in In ISCA Archive, International Speech Communication Association, Aug. 2023.

150. F. Catania, T. Talkar, F. Garzotto, B.R. Cowan, **T.F. Quatieri,** and S. Ghosh, "Multimodal Conversational Agents for People with Neurodevelopmental Disorders", in Proceedings of the 25th International Conference on Multimodal Interaction; Association for Computing Machinery, New York, NY, USA, pp. 824–825, 2023.

151. Z. Wazeer, N. Protyasha, C. Canales, R. Patel, J.R. WIlliamson, L. Sarnie, L. Nowinski, K. Nataliya, P. Townsend, S. Yuditskaya, T. Talkar, U.O. Sarawgi, C. McDougle, **T.F. Quatieri**, P. Maes, M. Mody, "Analyzing Speech Motor Movement using Surface Electromyography in Minimally Verbal Adults with Autism Spectrum Disorder", in International Speech Communication Association, Aug. 2024.

152. J. Dineley, E. Carr, L. White, C. Lucas, Z. Rahman, T. Pan, F. Matcham, J. Downs, R. Dobson, **T.F. Quatieri**, N. Cummins, "Variability of speech timing features across repeated recordings: a comparison of open-source extraction techniques", in ISCA Archive, International Speech Communication Association, Aug. 2024.

153. C. Beauchene, M. Brandstein, **T.F. Quatieri,** E. Thompson, and C.J. Smalt, "A Neurophysiological-Auditory 'Listen Receipt' for Communication Enhancement", in IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Seoul, Republic of Korea, pp. 2036-2040, 2024.

**Patents (13 issued and 1 filed)**

1. **T.F. Quatieri** and G.C. O'Leary, "Near and Far Echo Canceller for Data Communications", US Patent 4,742,510, 3 May 1988.

2. **T.F. Quatieri** and R.J. McAulay, "Audio Pre-Processing Methods and Apparatus", US Patent 4,856,068, 8 Aug. 1989.

3. R.J. McAulay and **T.F. Quatieri**, "Processing of Acoustic Waveforms", US Patent 4.885,790, 5 Dec. 1989.

4. R.J. McAulay and **T.F. Quatieri,** "Computationally Efficient Sine-Wave Synthesis for Acoustic Waveform Processing", US Patent 4937873, 26 June 1990.

5. R.J. McAulay and **T.F. Quatieri**, "Coding of Acoustic Waveforms", US Patent 5054072, 1 Oct. 1991.

6. **T.F. Quatieri**, "Two-Dimensional Processing of Speech", US Patent 7574352, 11 Aug. 2009.

7. T. Wang and **T.F. Quatieri,** "Method and apparatus for audio source separation", US Patent 8.498,863, 20 July 2013.

8. **T.F. Quatieri**, N. Malyska, C.N. Trevino, "Phonologically based biomarkers for major depressive disorder", US patent 9,763,617, 19 Sept. 2017.

9. **T.F. Quatieri**, J.R. WIlliamson, B. Helfer, R. Horwitz-Martin, B. Yu, D.D. Mehta, "Using correlation structure of speech dynamics to detect neurological changes". US Patent 10,561,361, 18 Feb. 2020.

10. **T.F. Quatieri**, G.A. Ciccarelli, S.S. Ghosh, C.J. Smalt, J.R. WIlliamson, J. Palmer, "Assessing disorders through speech and a computational model", US patent 10,127,929, Nov. 2014.

11. J.J. Lacirignola, T.R. Vian, C.J. Smalt, D.F. Aubin Jr, **T.F. Quatieri**, K.D. Fischl, ... ,D.C. Maurer, "Methods and apparatus for recording impulsive sounds", US Patent 10,074,397, 11 Sept. 2018.

12. J.J. Lacirignola, T.R. Vian, C.J. Smalt, D.F. Aubin Jr, **T.F. Quatieri**, K.D. Fischl, ... ,D.C. Maurer, "Methods and apparatus for recording impulsive sounds", (US Patent 9,478,229, 25 Oct. 2016.

13. G. Ciccarelli, C.J. Smalt, M. Nolan, J. Perricone, T. Calamia, S. Haro, …, **T.F. Quatieri,** …, N. Mesgarani, J. O'Sullivan, "End to end deep neural network for auditory attention decoding", US Patent 11,630,513, 18 April 2023.

14. **T.F. Quatieri,** J. Wang, J.R. WIlliamson, R. DeLaura, J. Taylor, J. Palmer, H. Reynolds, "Emotion-Driven Vocal Biomarker-Based PTSD Screening", Patent Application filed, 2024.

**Conference and Workshop Abstracts/Summaries (with either poster of oral presentation) (partial list)**

1. **T.F. Quatieri,** R.B. Dunn, T.E. Hanna, R.J. McAulay, "Time-scale modification of complex acoustic signals", in Conference Proceedings of the Acoustical Society of America, MIT, Cambridge MA, June 1994.

2. P. Maragos, **T.F. Quatieri**, J.F. Kaiser, "Demodulation of AM-FM resonances in speech using energy separation", in Conference Proceedings of the Acoustical Society of America, MIT, Cambridge MA, June 1994.

3. R.J. McAulay and T**.F. Quatieri**, "Speech coding based on a sinusoidal speech model", in Conference Proceedings of the Acoustical Society of America, MIT, Cambridge MA, June 1994.

4. B. Jacobson, G. Cauwenberghs, **T.F. Quatieri**, "Separation of musical instruments based on amplitude and frequency co-modulation", in Conference Proceedings of the Acoustical Society of America*,* 111, 2416, 2002.

5. R.B. Dunn, **T.F. Quatieri,** R. Schwartz, M. Piper, "Crosscorrelation-based pulse suppression for forensic audio analysis", in American Academy of Forensic Science Conference, Feb. 2005.

6. D.D. Mehta and **T.F. Quatieri,** "Aspiration noise during phonation: synthesis, analysis, and pitch-scale modification", in Harvard-MIT Division of Health Sciences and Technology Forum; Cambridge, MA, 2006.

7. D.D. Mehta, R.E. Hillman, **T.F. Quatieri**, "High-speed color videoendoscopy of human voice production", in Harvard-MIT Division of Health Sciences and Technology Forum; Cambridge, MA, 2007.

8. N. Malyska and T**.F. Quatieri**, "Analysis of nonmodal phonation using glottal pulse patterns", in 36th Annual Voice Foundation Symposium, Spring 2007.

9. D.D. Mehta, D. Deliyski, **T.F. Quatieri**, S.M. Zeitels, R.E. Hillman, "Ultra high-speed color videoendoscopy of human voice production", in Proceedings of the American Speech-Language-Hearing Association Convention; Boston, MA, 2007.

10. N. Malyska and **T.F. Quatieri,** "Measuring Voice Quality", in Best Practices in Sociophonetics Workshop, U. Pennsylvania, Winter 2008.

11. D.D. Mehta, M. Zañartu, **T.F. Quatieri,** D.D. Deliyski, R.E. Hillman, "Use of laryngeal high-speed videoendoscopy systems to study voice production mechanisms in human subjects", in Proceedings of The Acoustical Society of America; San Diego, CA, 2011.

12. E. Godoy, N. Malyska, **T.F. Quatieri**, "The Role of the Epilarynx in Clear Speech Production: An Acoustic Analysis", in International Conference on Voice Physiology and Biomechanics, Vina del Mar, Chile, 17 March 2016.

*13.* G. Ciccarelli, K. Sitek, M. Goncalves, C. de los Angeles, A. Sridhar, **T.F. Quatieri**, S. Ghosh, "Depression's Effect on Speaking: Probing the Neural Architecture of this Scalable Biomarker", in Organization of Human Brain Mapping Annual Conference, 2016.

14. K.R. Sitek, G.A. Ciccarelli, M. Gonclaves, C. de los Angeles, **T.F. Quatieri**, S.S. Ghosh, "Producing emotional speech: Limbic system involvement in speech motor control", in Organization of Human Brain Mapping Annual Conference, 2017.

15. **T.F. Quatieri**, J. O'Rourke, L. Nowinski, D. Hannon, A. Lammert, J.R. Williamson, E. Thiry, J.S. Palmer, C.G. Stamm, M. Mody, C. McDougle, "Quantifying fine motor dependencies in autism spectrum disorder", in Society for Neuroscience, Neuroscience, 2018.

16. J. Sharma, R. Landman, J. Hyman, L. Brattain, K. Johnson, **T.F. Quatieri,** K. Srinivasan, A. Wisler, G. Feng, M. Sur, R. Desimone, "Asymmetry in vocal communication in marmosets - influence of social context and gender differences", in Society for Neuroscience, Neuroscience, 2018.

17. **T.F. Quatieri,** B. Yu, J. Perricone, M. Nolan, D.D. Mehta, A. Lammert, J. Palmer, "Energy and correlation analysis of gait and EEG representations during an auditory working memory task", in Proceedings of the Conference on Movement and Cognition; Boston, MA, 2018. (*a best poster award)

18. S. Yuditskaya, J.R. WIlliamson, A. Lammert, D. Hannon, R. DeLaura, D.E. Sturim, G. Ciccarelli, J. Palmer, **T.F. Quatieri**, "mTBI Detection using Coordination of Vocal Dynamics in a Deep Learning Context", in Military Health System Research Symposium (MHSRS), 2019.

19. T. Talkar, A. Lammert, **T.F. Quatieri**, "Control modeling toward understanding articulatory disfluency in autism spectrum disorder", in Conference Proceedings of the Acoustical Society of America; 146 (4_Supplement), 2920, 1 Oct. 2019.

20. S. Haro, M. Nolan, G. Ciccarelli, P. Calamia, J. Perricone, J. O'Sullivan, N. Mesgarani, **T.F. Quatieri,** C.J. Smalt, "Influence of Competing Talker Loudness and Training-Data Quantity on EEG-based Auditory Attention Decoding Performance", in 42nd Meeting of the Association for Research in Otolaryngology, Baltimore, MD., Feb. 2019

21. T. Talkar, J.R. WIlliamson, D. Hannon, H. Rao, S. Yuditskaya, D. Sturim, K. Claypool, L. Nowinski, H. Saro, C. Stamm, M. Mody, C. McDougle, **T.F. Quatieri**, "Assessment of Speech Motor Coordination in Children with Autism Spectrum Disorder", in Speech Motor Conference/Signal Analytics for Motor Speech, 2020.

22. D.D. Mehta, L.J. Brattain, H. Rao, C.J. Smalt, K. Heaton, **T.F. Quatieri,** "Noise-robust, on-body, multimodal voice monitoring system for cognitive load classification during an immersive, virtual-reality marksmanship experiment", in Proceedings of the 5th International Congress on Soldiers' Physical Performance; Quebec City, Quebec, Canada, 2020.

*23.* H. Rao, C.J. Smalt, A. Rodriguez, H. Wright, D.D. Mehta, L.J. Brattain, H. Edwards, A. Lammert, K.J. Heaton, **T.F. Quatieri,** "Predicting cognitive load and operational performance in a simulated marksmanship task", in Proceedings of the Military Health System Research Symposium; Kissimmee, FL, 2020.

24. N. Seneviratne, C, Espy-Wilson, J.R. Williamson, A. Lammert, **T.F. Quatieri,** "Classification of Depression by Quantifying Neuromotor Coordination Using Inverted Vocal Tract Variables", in 12th International Seminar on Speech Production, 2020.

25. A. Lammert, J.R. Williamson, N. Seneviratne, C. Espy-Wilson, **T.F. Quatieri,** "A Coupled Oscillator Planning Account of the Speech Articulatory Coordination Metric With Applications to Disordered Speech", in 12th International Seminar on Speech Production, 2020.

26. G.A. Ciccarelli, D.D. Mehta, A.J. Ortiz, L.E. Toles, K.L. Marks, J.H. Van Stan, R.E. Hillman, **T.F. Quatieri**, "Ambulatory monitoring of the Lombard effect during the daily life of patients with hyperfunctional voice disorders", in Proceedings of the 14th International Conference on Advances in Quantitative Laryngology, Voice and Speech Research; Bogotà, Colombia, 2021.

27. S. Haro, G. Ciccarelli, H. Rao, **T.F. Quatieri,** C.J. Smalt, "Neural Indicators of Auditory Attention Switching in a Multi-talker Listening Scenario", in 44th Meeting of the Association for Research in Otolaryngology, Feb 2021.

28. **T.F. Quatieri.,** T. Talkar, K.T. Johnson, J. Narain, R.W. Picard, "Quantifying the Complexity of Vocal Expression Using Articulatory Coordination" in 2022 International Society for Autism Research (INSAR) Annual Meeting, Austin, Texas (panel), 2022.

29. K.T. Johnson, J. Narain, A.M. O'Brien, A. Kershenbaum, **T.F. Quatieri,** R.W. Picard, "Phonemic Content of Nonverbal Vocalizations from Individuals with 0-10 Spoken Words", in 2022 International Society for Autism Research (INSAR) Annual Meeting, Austin, Texas (panel), 2022.

30. J. Narain, K.T. Johnson, **T.F. Quatieri,** R.W. Picard, P. Maes, "Acoustic Features and Models to Classify Communication and Intent of Nonverbal Vocalizations from Minimally Speaking Individuals with Autism", in 2022 International Society for Autism Research (INSAR) Annual Meeting, Austin, Texas (panel), 2022.

31. C. Beauchene, S. Haro, M. Brandstein, **T.F. Quatieri,** C.J. Smalt, "Subject-Specific Adaptation for a Causal, Real-time, Auditory-Attention Decoding System", in 45th Meeting of the Association for Research in Otolaryngology, Orlando, FL., Feb. 2023.

32. S. Haro, G. Ciccarelli, **T.F. Quatieri,** C.J. Smalt, "Deep Neural Network of Hearing-Impaired Speech-in-Noise Perception", in 43rd Meeting of the Association for Research in Otolaryngology, San Jose, CA, Feb. 2023.

33. R. DeLaura, J. Wang, J.R. Williamson, T. Talkar, N.P. Solomon, S.E. Kuchinsky, M. Eitel, T. Brickell, S. Lippa, K.J. Heaton, D.S. Brungart, L. French, R. Lange, J. Palmer, H. Reynolds, **T.F. Quatieri, "**Impact of signal quality and environmental requirements on the potential benefits of a vocal biomarker-based PTSD screening tool", in Military Health System Research Symposium (MHSRS), 2023.

34. J. Pawlitzki, H.M. Rao, **T.F. Quatieri,** S. Glasauer, "Using two-dimensional oculomotor modeling to analyze smooth pursuit performance", in Federation of European Neuroscience Societies, Science Communications World Wide, 2024.

35. K. Smith, J.R. Williamson, **T.F. Quatieri**, "Speech acoustic markers to detect mild cognitive impairment in Parkinson's disease", Movement Disorders, 39 (suppl 1), 2024.

36. S.M. Radhakrishnan, A.M. O'Brien, **T.F. Quatieri**, K.T. Johnson, "An exploratory investigation of acoustic features underlying arousal and valence perception of vocalizations from non-speaking individuals", in Conference Proceedings of the Acoustical Society of America, 1, March 2024.

37. M. Pecukonis, P. Townsend, L. Nowinski, L. Sarnie, C. Jafari, N. Kosmyna, J. Protyasha, J.R. WIlliamson, S. Yuditskaya, P. Maes, **T.F. Quatieri**, C. McDougle, M. Mody, "Investigating the relation between fine motor skills and expressive and receptive language skills in minimally verbal autistic adults using structural equation modeling", in International Society for Autism Research (INSAR) Annual Meeting, 2025. (accepted)

38. S. Yuditskaya, C. Jafari, P. Townsend, L. Nowinski, J.R. WIlliamson, M. Pecukonis, N. Kosmyna, J. Protyasha, L. Sarnie, C. McDougle, P. Maes, M. Mody, **T.F. Quatieri,**

**“**Analyzing correlations between oculomotor behavior and cognitive ability in minimally verbal autism”, in International Society for Autism Research (INSAR) Annual Meeting, 2025. (accepted)

39. S. Yuditskaya, C. Jafari, P. Townsend, L. Nowinski, J.R. WIlliamson, M. Pecukonis, L. Sarnie, N. Kosmyna, J. Protyasha, C. McDougle, P. Maes, M. Mody, **T.F. Quatieri, “**Using low-level movement dynamics during drawing and handwriting tasks to estimate nonverbal cognitive ability in minimally verbal autism”, in International Society for Autism Research (INSAR) Annual Meeting, 2025. (accepted)

**Invited Academic Seminars (partial list)**

1. Homomorphic Deconvolution, MIT Advanced Digital Signal Processing Class, Fall 1980.

2. Adaptive Homomorphic Deconvolution and the Complex Cepstrum, MIT Advanced Digital Signal Processing Class, Fall 1981.

3. Object Detection by 2-D Linear Prediction, Naval Post Graduate School, June 1983.

4. Signal Reconstruction from Short-Time Fourier Transform Magnitude, MIT Digital Signal Processing Seminar Series, Fall 1983.

5. Speech Analysis-Synthesis Based on a Sinusoidal Representation, Boston Section IEEE, (with R.J. McAulay), Sept. 1984.

6. Midrate Speech Coding and Speech Transformations Based on the Sinusoidal Model, Bolt, Beranek, and Newman (BBN) Lecture Series, (with R.J. McAulay), Oct. 1984.

7. Midrate Coding and Audio Enhancement Using the Sinusoidal Speech Model, Boston Section IEEE, (with R.J. McAulay), Sept. 1986.

8. Speech Transformations Based on a Sinusoidal Representation, Brown University, Signals and Systems Class, Dec. 1986.

9. Speech Enhancement for AM Radio Broadcasting, MIT Lincoln Laboratory Steering Committee, March 1988.

10. Speech Enhancement Based on Sinusoidal Modeling, MIT RLE/Lincoln Laboratory Symposium, July 1989.

11. Speech Transformations Based on a Sinusoidal Model, Speech Processing and Recognition workshop, Harvard, Jan. 1990.

12. Nonlinear Speech Modeling, MIT Digital Signal Processing Seminar Series, Dec. 1990.

13. Nonlinear Speech Modeling, NATO, Feb. 1991

14. Speech Enhancement Using the Sine-Wave Model, Tufts University, graduate class seminar, May 1991.

15. Speech Enhancement Based on a Sinusoidal Representation, Cornell University, March 1992.

16. Wavelets and their Applications, MIT Lincoln Laboratory steering committee, Sept. 1993.

17. Pitch, Time-Scale, and Spectral Modification of Speech, MIT Lincoln Laboratory Division 6 Seminar Series, 2000.

18. Robust Speech Processing Using Nonacoustic Sensors, MIT Speech Communications Group Seminar Series, 2004.

19. Forensic Audio Tape Enhancement, USSS Forensic Features Workshop, 2004.

20. Robust Speech Processing Using Nonacoustic Sensors, Nellymoser Speech Group, 2005.

21. Low-Rate Speech Coding in Military Environments, MIT Lincoln Laboratory Division 6 Seminar Series, 2005.

22. Voice Quality, SocioLinguistics workshop, U. Pennslyvania, (with N. Malyska), Fall 2007.

23. 2-D Processing of Speech with Application to Pitch and Formant Estimation, Harvard Workshop on Next-Generation Statistical Models for Speech and Audio Signal Processing, (with T. Wang), Fall 2007.

24. Vocal Biomarkers of Neurological Conditions Based on Motor Timing and Coordination, Keynote, 17th Speech Science and Technology Conference (SST2018), 2018.

25. Vocal Biomarkers of Neurological Conditions Based on Motor Timing and Coordination, Keynote, Neurodevelopmental Disorders and Cures Clinical and Experimental Neurosciences program at the Utrecht Graduate School of Lifesciences, (with T. Talkar), 2020.

26. Vocal Biomarkers of Neurological Conditions Based on Motor Timing and Coordination, IEEE Engineering in Medicine and Biology Society (EMBS), Grand Challenges Forum on Data Science and Engineering in Healthcare, Feb. 2021.

27. Vocal Biomarkers of Neurological Conditions Based on Motor Timing and Coordination, Keynote, Speech Motor Conference/Signal Analytics for Motor Speech, 2022.

28. A Framework for Vocal Biomarkers of COVID-19, TUFTS Human Factors Seminar Series, Dec. 2020.

29. A Framework for Biomarkers of COVID-19 Based on Neuromotor Coordination in Speech, MIT Sense.nano 2020 Symposium.

30. On Dreams and Creativity, Brownbag Series of Human Health and Performance Group, MIT Lincoln Laboratory, 2022.

31. Screening for PTSD Utilizing Vocal Biomarkers, IEEE OJEMB symposium on Computational Modeling & Digital Twin Technology in Biomedical Engineering (seminar and panel; with J. Wang and R. DeLaura), 2023.

**University Level and Other Teaching (see Positions for faculty appointments) (partial list)**

1. 1990–2004: creator and lecturer of MIT graduate course Digital Speech Processing; lectured entire course except for a few guest lectures; given seven times biannually 1990-2004 during Fall semesters

2. 1980–present: MIT guest lecturer in graduate signal and speech courses

3. March 1975: lectured MIT undergraduate course Introductory Digital Systems Laboratory

4. Summer 1976: lectured entire MIT undergraduate course Signals and Systems

5. March 1982: lectured two weeks for MIT graduate course Advanced Digital Signal Processing

6. Fall 2004: taught two weeks of the Lincoln Laboratory Forensic Speaker Recognition Course given to government personnel

7. Spring 2008: taught half-day tutorial on Speech Production and Phonetics to government personnel

## Student Supervision

**Doctoral Theses Supervision**

1. C. Jankowski (MIT EECS), Fine Structure Features for Speaker Identification, PhD Thesis, (co-advisor with Kenneth Stevens), 1996.

2. N. Malyska (MIT SHBT*), Analysis of Nonmodal Glottal Event Patterns with Application to Automatic Speaker Recognition, PhD Thesis, 2008.

3. B. Jacobson (MIT SHBT), Instantaneous Frequency Techniques for Comodulation-Based Audio Source Separation, PhD Thesis, (co-advisor with Gert Cauwenberghs), 2008.

4. D. Mehta (MIT SHBT), Effects of Vocal Fold Vibratory Asymmetries on Acoustic Voice Characteristics During Sustained Phonation, PhD Thesis, (co-advisor with Robert Hillman), 2010.

5. T. Wang (MIT SHBT), Sound Separation Based on a 2-D Framework, PhD thesis, 2011.

6. G. Cicarrelli (MIT McGovern Brain Institute), Characterization of Phoneme Rate as a Vocal Biomarker of Depression, (co-advisor with Satra Ghosh), 2017.

7. R. Horwitz (MIT SHBT), Relation of Articulatory-Inspired Acoustic Features with Speech in Amyotrophic Lateral Sclerosis, PhD thesis, (co-advisor with Jordan Green), 2017.

8. T. Talkar (Harvard SHBT), Detection and Characterization of Autism Spectrum Disorder and Parkinson's Disease Utilizing Measures of Speech- and Fine-Motor Coordination, PhD thesis, 2023.

9. S. Haro (Harvard SHBT), Speech Perception and Auditory Attention in Noisy and Multi-Talker Environments, PhD thesis, 2023.

**Masters Thesis (MS) Supervision**

1. A. Ruiz (MIT EECS student), Windowing Effects in Short-Time Homomorphic Deconvolution, MS Thesis, MIT, (co-advisor with Alan Oppenheim), Feb. 1978.

2. R. Danisewitz (MIT EECS student), Speaker Separation of Steady State Vowels, MS Thesis, MIT, May 1987.

3. D. Dabby (MIT EECS student), Implementation of Chaotic Circuits, MS Thesis, MIT, (co-advisor with James Roberge), June 1991.

4. D. Ellis (MIT Media Lab student), A Perceptual Representation for Sound Separation, MS Thesis, MIT, (co-advisor with Barry Vercoe), June 1992.

5. P. Oberoi (MIT EECS student), Application of Wavelets to Sine-Wave Speech Coding, MS Thesis, MIT, , (co-advisor with Robert McAulay), June 1995.

6. A. Fu (MIT Media Lab student), Resynthesis of Acoustic Piano Recordings, MS Thesis, MIT, (co-advisor with Michael Hawley), May 1996.

7. W. Torres (MIT EECS student), Estimation of Signal Modulation Based on FM-to-AM transduction, MS Thesis, MIT, May 1997.

8. A. Mustapha (MIT 6-A student at COMSAT), Postfiltering Techniques in Low Bit-Rate Speech Coders, MS, MIT, (co-advisor), May 1998.

9. M. Plumpe (MIT EECS student), Modeling the Glottal Flow Derivative Waveform with Application to Speaker Identification, MS Thesis, MIT, Jan. 1997.

10. M. Padilla (MIT EECS student), Missing Feature Theory for Improved Speaker Recognition under Mismatch Conditions, MS Thesis, MIT, Feb. 2000.

11. S. Govindasamy (MIT 6-A student at Qualcomm), A Psychoacoustically Motivated Speech Enhancement System, MS Thesis, MIT, (co-advisor), Jan. 2000.

12. D. Messing (MIT EECS student), Noise Suppression with Non-Air-Acoustic Sensors, MS Thesis, MIT, Jan. 2001.

13. C. Chow (MIT 6-A student at Texas Instruments), Objective Quality Measures for Speech Coders, MS Thesis, MIT, (co-advisor), Jan. 2001.

14. N. Malyska (MIT SHBT* student), Automatic Voice Disorder Recognition using Acoustic Amplitude Modulation Features, MS Thesis, MIT, Feb. 2004.

15. D. Mehta (MIT SHBT student), Aspiration Noise during Phonation: Extracting, Characterizing, and Modifying, MS Thesis, MIT, Jan. 2006.

16. T. Wang (MIT SHBT student), Exploiting Pitch Dynamics for Speech Spectral Estimation Using a Two-Dimensional Processing Framework,, MS Thesis, MIT, Jan. 2008.

17. K. Dietz (MIT EECS student), Acoustic and Linguistic Interdependence of Irregular Phonation, MS Thesis, MIT (co-advisor with Stephanie Shattuck-Hufnagel), Jun. 2010.

18. R. Horwitz (MIT SHBT student), Vocal Modulation Features in the Prediction of Major Depressive Disorder Severity, MS Thesis, MIT, June 2014.

**Recent Post-Doc/MD Mentoring in Speech Modeling and Processing for Digital Health**

1. Dr. Fabio Catania, post-doc at MIT McGovern Brain Institute, visiting from Italy
2. Dr. Daniel Low, post-doc at Harvard Nock Lab
3. Dr. Nicolaus Cummins, Professor at King's College London
4. Dr. Jordan Green, Professor at MGB Institute for Health Professions (mentor on NIH K-traineeship)

5. Dr. Kate Bentley, Director MGB Precision Psychology (mentor on NIH K-traineeship)
6. Dr. Kara Smith, MD at UMass Med Center (mentor on NIH K-traineeship)

**PhD Thesis Committee Member/Chair (partial list)**

1. H. Nawab (MIT EECS student under Alan Oppenheim), Signal Reconstruction from Short-Time Fourier Transform Magnitude, PhD Thesis, MIT (committee member), 1986.

2. M. Zissman, (MIT EECS student under Louis Braida), Co-Channel Talker Interference Suppression, PhD Thesis, MIT (committee member), 1990.

3. D. Beyerbach (BU student under Hamid Nawab), On Principle Components Analysis of Time-Frequency Representations, PhD Thesis, Duke (committee member), 1995.

4. G. S. Meltzner (MIT SHBT student under Bob Hillman ), Perceptual and Acoustic Impacts of Aberrant Properties of Electrolaryngeal Speech, PhD Thesis, MIT (committee member), 2003.

5. V. Villacorta (MIT SHBT student under Frank Gunther), Speech Sensorimotor Adaptation - Acoustic Perturbation in Real Time, PhD Thesis, MIT (committee member), 2005.

6. A. Masaki (MIT SHBT student under Bob Hillman), Optimizing Acoustic and Perceptual Assessment of Voice Quality in Children with Vocal Nodules, PhD Thesis, MIT (Proposal Advisory Committee and Thesis Committee Chair), 2008.

7. N. Chen (MIT Health Science Technology (HST) student under Joe Campbell), Towards Informative Automatic Dialect Recognition, PhD thesis, MIT (Thesis Committee Chair), 2011.

8. D. Rudoy (Harvard student under Patrick Wolfe), Dynamical Speech Modeling for Speech Enhancement, PhD Thesis, Harvard (committee member), 2012.

9. R. Deering (Duke student under John Hansen), Fine-Scale Analysis of Speech Using Empirical Mode Decomposition: Insight and Applications, PhD Thesis, Duke (committee member), 2006.

10. S. Ganapathy (John Hopkins student under Hynek Hermansky), Signal Analysis Using Autoregressive Models of Amplitude Modulation, PhD Thesis, John Hopkins (committee member), 2007.

11. N. Cummins (UNSW Australia student under Julien Epps), Automatic Assessment of Depression from Speech: Paralinguistic Analysis, Modelling and Machine Learning, PhD thesis, UNSW Australia (committee member), 2016.

12. A. Ditthapron (Worcester Polytech Institute (WPI) student under Adam Lammert), Mobile Paralinguistic Health Assessment from Speech: Energy-Efficient and Privacy-Preserving Neural Network Models, PhD thesis, WPI (committee member), 2023.

**PhD Oral Qualifying Exam Committee Member (partial list)**

1. ~1993: Helen Hanson (Harvard student under Petros Maragos)
2. ~1995: Elizabeth Choi (MIT EECS student under Kenneth Stevens)
3. ~2005: Virgilio Villacorta (Boston University SHBT* student under Frank Gunther)
4. 2023: Charles Hems (Harvard SHBT student under Julie Arenberg)
5. 2023: A. Ditthapron (Worcester Polytech Institute (WPI) student under Adam Lammert)
6. 2024: Victoria Sanchez (Harvard SHBT student under Karen Chenausky)

**Summer Interns Supervised (partial list)**

1. 1989: H.D. Vo (MIT Co-op student): Fractal Modeling of One-Dimensional Waveforms
2. 2010: Tom Baran (MIT EECS grad student under Al Oppenheim): Preserving the Character of Perturbations in Scaled Pitch Contours
3. 2011: Andrea Trevino (U Illinois grad student under Jont Allen), Phonologically-Based Biomarkers for Major Depressive Disorder
4. 2012: Mika Braginsky (MIT UROP student): Correlating Language and Motor Control: Interference Effects between Language and Action Systems
5. 2012: Jordan Ashley Whitlock (MIT UROP student): Interaction of Linguistics, Cognition, and Motor Control in Central Nervous System Disorders
6. 2016: Katherine Thiry (Tufts Human Factors Masters Program under Dan Hannon): Design of a Multi-Modal Platform for Fine-Motor-Based Biomarkers of Autism
7. 2018: Camile Noufi (Stanford student): Vocal Biomarker Assessment Following Pediatric Traumatic Brain Injury
8. 2019: Matt Perez (U Michigan GEMS student under Emily Mower-Provost): Specificity of Fine-Temporal Features for Depression, TBI, and Healthy Speech in Different Environments and Channels
9. 2021: Marisol Castellanos (GEMS USC student): Correlation Analysis For Vocal Biomarkers and Brain Stimulation for Parkinson's Disease

*SHBT = MIT-Harvard Speech and Hearing Bioscience and Technology