Hamid Motallebzadeh, Ph.D.

Contact information
Campus Office: Folsom Hall 2404E
Campus Office Phone: (916) 278-3589
Campus email: h.motallebzadeh@csus.edu

American Speech-Language and Hearing Association (ASHA) Certificate of Clinical Competence (CCC)
Not applicable

California Professional License
Not applicable

California Teaching Credentials
Not applicable

Additional Professional Licensure(s) and Credentials
Not applicable

Education

B.Sc. Mechanical Engineering,	Amirkabir University of Technology, Tehran, Iran.	2005
M.Sc. Mechanical Engineering,	Amirkabir University of Technology, Tehran, Iran.	2009
Ph.D. Biomedical Engineering,	McGill University, Montreal, Canada.	2015

Postdoctoral Training

- Stanford University, Mechanical Engineering 2015 – 2016
- Harvard University, Harvard Medical School 2016 – 2019

Major areas of research interests
Computational, experimental and clinical research in hearing biomechanics

Publications and papers completed

1. Motallebzadeh H, Puria S (2021) Mouse middle-ear forward and reverse Acoustics. *J. of Acoustical Society of America 149(4): 2711-2731*

2. Tubelli A, Motallebzadeh H, Guinan Jr JJ, Puria S (2021) A gerbil cochlea-slice model is tuned not by mechanical resonance but by local cochlear wavelength. *Biophysical Journal (in press)*.

3. Motallebzadeh H, Puria S (2021) Reflections Obscure Otoacoustic Emission and Middle-Ear Forward and Reverse Pressure Gain Measurements. *J. of Acoustical Society of America (under review)*.

4. Motallebzadeh H, Deistler M, Schönleitner F, Macke J, Puria S (2021) Machine-learning based objective tuning of computational models: simulation-based inference of the middle-ear parameters *(under review)*.

5. Milazzo M, Motallebzadeh H, Tubelli A, Puria S (2021) Non-invasive measures of the efficiency of middle ear prosthesis placement and length. *(submitted)*.

6. Motallebzadeh H, Soons JA, Puria S (2018) Cochlear amplification and tuning depend on the cellular arrangement within the organ of Corti. *Proceedings of the National Academy of Sciences (PNAS)* 115(22):5762–5767.

7. Motallebzadeh H, Puria S (2018) Stimulus frequency otoacoustic emission generation within a finite element model of the mouse cochlea: The effect of impedance irregularities of organ of Corti structures. *American Institute of Physics Conference Proceeding* 1965(1):140004.
8. Maftoon N, Motallebzadeh H, Guinan Jr JJ, Puria S (2018) Drive mechanisms to the inner and outer hair cell stereocilia. *American Institute of Physics Conference Proceeding* 1965(1):120002.

9. Motallebzadeh H, Maftoon N, Pitaro J, Funnell WRJ, Daniel SJ (2017) Fluid-Structure Finite-Element Modelling and Clinical Measurement of the Wideband Acoustic Input Admittance of the Newborn Ear Canal and Middle Ear. *Journal of the Association for Research in Otolaryngology* 18(5):671–686.

10. Motallebzadeh H, Maftoon N, Pitaro J, Funnell WRJ, Daniel SJ (2017) Finite-element modelling of the acoustic input admittance of the newborn ear canal and middle ear. *Journal of the Association for Research in Otolaryngology* 18(1):25–48.

11. Pitaro J, Al Masaoudi L, Motallebzadeh H, Funnell WRJ, Daniel SJ (2016) Wideband reflectance measurements in newborns: Relationship to otoscopic findings. *International Journal of Pediatric Otorhinolaryngology* 86:156–160.

12. Motallebzadeh H, Tafazzoli-Shadpour M, Khani MM (2015) Dynamic stress distribution in a model of implanted mandible: numerical analysis of viscoelastic bone. *Journal of Mechanics in Medicine and Biology* 15(04):1550050.

13. Motallebzadeh H, Charlebois M, Funnell WRJ (2013) A non-linear viscoelastic model for the tympanic membrane. *Journal of the Acoustical Society of America* 134(6):4427–4434.

14. Charlebois M, Motallebzadeh H, Funnell WRJ (2013) Visco-hyperelastic law for finite deformations: a frequency analysis. *Biomechanics and Modeling in Mechanobiology* 12(4):705–715.

Presentations completed

Invited talks (selected)

1. Using machine learning and neural networks to estimate finite element model parameters of the middle ear and cochlea, Mechanics of Hearing Conference, CA, USA 2021

2. Middle-ear and cochlear model parameter estimation with machine learning, Harvard University, Cambridge, MA, USA. 2021

3. Listening with ears and listening to ears, Biomedical Engineering Department, McGill University, Montreal, Canada. 2020

4. Cochlear active process and optoacoustic emissions: A finite-element study, Eaton-Peabody Laboratories, Harvard University, Cambridge, MA, USA. 2017

5. Numerical modeling of auditory systems, Wellman Center for Photomedicine, Massachusetts Institute of Technology (MIT) Cambridge, MA, USA. 2017

6. Biomechanics; Numerical modeling of biological systems, Mechanical Engineering Department, Memorial University of Newfoundland, St John's, NL, Canada. 2016

Podium Talks (selected)

1. Motallebzadeh H, Schoenleitner F, Puria S (2020), Simulation-based inference of middle-ear pathologies,
2. Mass. Eye and Ear seminar of machine-learning applications in hearing, speech and vision, Harvard University, Cambridge, MA, USA.

3. Motallebzadeh H, and Puria S (2018), The effect of localized organ of corti impedance irregularities on stimulus-frequency otoacoustic-emission generation: a mouse-cochlea finite-element model study. Association for Research in Otolaryngology 41st MidWinter Meeting, San Diego, CA, USA.

4. Motallebzadeh H, and Puria S (2016), The mouse organ of Corti 3D cytoarchitecture coupled to the cochlear duct fluid in a finite element model, IUTAM Symposium on Advances in Biomechanics of Hearing, Stuttgart, Germany.

5. Motallebzadeh H, Maftoon N, Funnell WRJ and Daniel, SJ (2014), Finite-element modelling of the newborn ear canal and middle ear. Biomechanics Research in Quebec, Montréal, Canada.

6. Motallebzadeh H, Gariepy B, Maftoon N, Funnell WRJ and Daniel, SJ (2013), Finite-element modelling of the newborn ear canal and middle ear. 21st International Congress on Acoustics, Montréal, Canada.

7. Motallebzadeh H, Charlebois, M., Funnell, WRJ and Daniel, SJ (2012), A nonlinear viscoelastic model for the tympanic membrane. Association for Research in Otolaryngology 35th MidWinter Meeting, San Diego, CA, USA.

Posters and abstracts (selected)

1. Motallebzadeh H, Deistler M, Schönleitner F.M., Macke J.H., and Puria S (2022), Using Machine Learning to Determine the Probability Distribution of Middle-ear and Cochlear Model Parameters ARO 45th MidWinter Meeting San Jose, CA, USA.

2. Tubelli A, Motallebzadeh H, Qin M, Guinan J, and Puria S (2022), The drive to inner and outer haircell bundles in a slice model of the gerbil cochlea, Mechanics of Hearing Conference, Copenhagen, Denmark.

3. Tubelli A, Motallebzadeh H, Guinan J and Puria S (2021), Stereocilia motion in a passive, radial-slice model of the gerbil cochlea, ARO 44th MidWinter Meeting (Virtual Conference), USA.

4. Milazzo M, Motallebzadeh H, Tubelli A and Puria S (2021), Non-invasive measures of the efficiency of middle-ear prosthesis placement and length, ARO 44th MidWinter Meeting (Virtual Conference), USA.

5. Motallebzadeh H and Puria S (2020), The effects of the mouse middle ear on otoacoustic emissions. ARO 43rd MidWinter Meeting, San Jose, CA, USA.

6. Motallebzadeh H (2019), Application of artificial intelligence and machine-learning methods in hearing screening in newborns: Dimensionality reduction of demographic and physiological data. 4th International Hearing Loss Conference, Ontario, Canada.

7. Motallebzadeh H and Puria S (2019), Middle-ear transmission and generation of stimulus-frequency otoacoustic emissions (SFOAEs): finite-element mouse model. ARO 42nd MidWinter Meeting, Baltimore, MD, USA.

8. Motallebzadeh H and Puria S (2018) Middle-ear forward and reverse transmission and their effect on the otoacoustic emissions in a mouse finite-element model, The 8th International Symposium in Middle Ear Mechanics in Research and Otology (MEMRO), Shanghai, China (Poster award).

9. Maftoon N, Motallebzadeh H, Guinan JJ, and Puria S (2018) Inner and outer hair cell stereocilia bundle stimulation in a passive cochlear model, Association for Research in Otolaryngology 41st MidWinter Meeting, San Diego, CA, USA.

10. Motallebzadeh H and Puria S (2017), Finite-element model of the nonlinear distortion and linear reflection sources of the otoacoustic emissions within the mouse cochlea, The Acoustical Society of America, Boston, MA, USA.

11. Motallebzadeh H and Puria S (2017), Finite-element modeling of stimulus-frequency otoacoustic emission generation within the mouse cochlea: the effect of impedance irregularities of organ of corti structures, Mechanics of Hearing, St. Catharines ON, Canada (Best presentation award)

12. Motallebzadeh H and Puria, S (2017), Sensitivity of basilar-membrane and reticular-lamina motions to organ-of-corti cytoarchitectural parameters, ARO 40th MidWinter Meeting, Baltimore, MD. USA.

13. Motallebzadeh H and Puria, S (2016), The efficiency of the cytoarchitecture of the organ of Corti for active cochlear amplification, 172nd Meeting of Acoustical Society of America, Honolulu, HA. USA.

14. Motallebzadeh H, Pitaro J, Funnell WRJ and Daniel SJ (2015), Fluid-structure finite-element modelling of the wideband acoustic input admittance of the newborn ear canal and middle ear, ARO 39th MidWinter Meeting, San Diego, CA, USA.

15. Motallebzadeh H, Funnell, WRJ and Daniel SJ (2015), Sensitivity analyses of finite-element models of newborn ear canal and middle ear. 7th International Symposium on Middle Ear Mechanics in Research and Otology, Aalborg, Denmark.

16. Pitaro J, Al Masaoudi L, Motallebzadeh H, Funnell WRJ and Daniel SJ (2015), Wideband reflectance measurements in newborns: relationship to otoscopic findings, American Society of Pediatric Otolaryngology (ASPO), Boston, MA. USA (Presentation award).

17. Motallebzadeh H, and Funnell WRJ (2015), Nonlinear viscoelastic models for middle-ear ligaments and tendons. ARO 38th MidWinter Meeting, Baltimore, MD, USA.

18. Motallebzadeh H, and Tafazzoli-Shadpour M (2014), Dynamic stress distribution in implanted mandible: numerical analysis of viscoelastic bone, 7th World Congress of Biomechanics. Boston, MA, USA.

19. Motallebzadeh H, Maftoon N, Funnell WRJ and Daniel, SJ (2014), Finite-element modelling of the newborn ear canal and middle ear. ARO 37th MidWinter Meeting, San Diego, CA, USA.

20. Motallebzadeh H, Gariepy, B, Maftoon, N, Funnell, WRJ and Daniel, SJ (2013), Finite-element modelling of the newborn ear canal and middle ear. ARO 36th MidWinter Meeting, Baltimore, MD, USA.

21. Motallebzadeh H, Charlebois, M, Funnell, WRJ and Daniel, SJ (2012), A nonlinear viscoelastic model for the tympanic membrane. ARO 35th MidWinter Meeting, San Diego, CA, USA.

Grants submitted

- Noninvasive diagnosis of middle-ear pathologies with machine learning
    - Mass General Brigham Innovation Discovery Grants (Principal Investigator)
- Mechanics of the outer and middle ear in newborns and infants
    - Canadian Institutes of Health Research (Co-applicant)
- Non-invasive diagnosis of conductive hearing pathologies using machine learning
    - Harvard Catalyst Translational Innovator Program (Co-investigator)

Grants awarded

Current

- Objective and noninvasive diagnosis of middle-ear and conductive pathologies using simulation-based inference and transfer learning applied to clinical data
    - NIH R21 (Principal Investigator) $630,000 2022 – 2025

Past

- Mechanics of the outer and middle ear in newborns and infants 2013 – 2017
    - Canadian Institutes of Health Research (Key Personnel)
- Hearing screening and diagnosis in newborns (Key Personnel) 2009 – 2013
    - Canadian Institutes of Health Research
- International Doctoral Awards from McGill University 2009 – 2015
    - Research support for graduate PhD students (Applicant)
- Measuring and modeling the cochlear motions that drive the inner and outer hair cells and produce otoacoustic emissions
    - NIH R01 DC07910 (Significant contributor) 2017 – 2022

Activities related to clinical service delivery

Not applicable/ Information not provided

Clinical supervision experience
Not applicable/ Information not provided

Professional development experiences
Not applicable/ Information not provided

Professionally related service activities
Conference organization

- Session chair of Inner-Ear Mechanics, Association for Research in Otolaryngology (San Jose, CA, USA) 2022
  Chair of Joint Mass. Eye and Ear seminar of machine-learning applications in hearing, speech and vision,
- Harvard University, Cambridge, MA, USA. 2020
- Session chair of Middle-Ear Mechanics, Association for Research in Otolaryngology (Baltimore, MD, USA) 2019
- Session chair of Comsol Conference: applications of multi-physics FEM (Boston, MA, USA) 2018
- Session chair of Mechanical Engineering Conference (Stanford University, CA, USA) 2016
- Co-organizer of 1st Conference of Biomechanics in Research in Quebec(Montreal, Canada) 2014

Ad Hoc Reviewer

Scientific reports, Journal of the Acoustical Society of America, Journal of Hearing Research, Journal of the Royal Society Interface, Journal of Biomedical Engineering and Technology, Journal of Mechanical Systems and Signal Processing, Bioscience Reports, Engineering in Medicine, Royal Society Open Science, IEEE Transactions on Biomedical Engineering, Otology & Neurotology

Membership

- Acoustical Society of America 2011 – present
- Association for Research in Otolaryngology 2011 – present

Community Partnerships/Community Outreach
Not applicable/ Information not provided

Service on Departmental, College and University committees.
Not applicable/ Information not provided

Academic/Professional Honors and Recognition
- Best poster presentation award of International Symposium in Middle Ear Mechanics (Shanghai, China). 2018
- Best presentation award of Mechanics of Hearing Conference (St. Catharines, Canada). 2017
- Postdoctoral fellowship Patents, Harvard Medical School, Harvard University. 2016
- Postdoctoral fellowship, Mechanical Engineering Department, Stanford University. 2015
- Presentation award of American Society of Pediatoric Otolaryngology. 2015
- Graduate Research Enhancement Award (5 years in row), McGill University. 2010 – 2015
- International Doctoral Awards, McGill University. 2009
- Provost's Graduate Study Award, McGill University. 2009
- First rank of admittance exam of BioMedical Eng., Amirkabir University of Technology. 2005
- First rank of admittance exam of Mechanical Eng., Amirkabir University of Technology. 2001

Patents
- Motallebzadeh H, Artificial Intelligence Engine for Hearing Screening (Submitted to MEEI Office of Intellectual Property & Commercial Ventures)
- Motallebzadeh H Michael Deistler, Florian Schönleitner, Jakob Macke and Sunil Puria, Objective and noninvasive diagnosis of middle-ear and conductive pathologies using simulation-based inference (Submitted to MEEI Office of Intellectual Property & Commercial Ventures)

Media Highlights

- The Global Source for Science News (2018): Organization of cells in the inner ear enables the sense and
- sensitivity of hearing. Available at: https://goo.gl/2bFApz
- Medical Press (2018): Organization of cells in the inner ear enables the sense and sensitivity of hearing.
- Available at: https://goo.gl/MvzCpe
- Global Times, Source: Xinhua (2018): Inner ear cells arranged in particular order to hear things. Available
- at: https://goo.gl/CyVVYe
- Mass Eye and Ear Press Release (2018): Spatial organization of cells in the inner ear enables the sense and
- sensitivity of hearing. Available at: https://goo.gl/7W7Xmg
- Harvard Medical School, Department of Otolaryngology News (2018): Spatial Organization of Cells in the
- Inner Ear Enables the Sense and Sensitivity of Hearing. Available at: https://goo.gl/7JBnYt
- NewsWise (2018): Spatial Organization of Cells in the Inner Ear Enables the Sense and Sensitivity of Hearing.
- Available at: https://goo.gl/244WuJ
- Harvard Medical School News (2018): Function Follows Form. Available at: https://goo.gl/dmvvjV

Courses taught at Sacramento State

CSAD 130. Introduction to Audiology.
Spring 2023

CSAD 130-50. Introduction to Audiology.
Spring 2023

CSAD 299. Special Problems: Research Readiness
Summer 2023

CSAD 611. Anatomy and Physiology of the Auditory and Vestibular Systems.
Fall 2022, 2023

CSAD 612. Acoustics and Psychoacoustics.
Fall 2023

CSAD 642. Industrial Audiology and Hearing Conservation.
Fall 2022, 2023

CSAD 631. Amplification II.
Summer 2023

CSAD 651. Objective Measures.
Spring 2023

[BS] Courses taught in the Communication Sciences and Disorders Bachelor of Science program

[2B] Courses taught in the Communication Sciences and Disorders Second Bachelor program (CSAD2B)

[MS] Courses taught in the Communication Sciences and Disorders Master of Science program

[A] Courses taught in the Communication Sciences and Disorders Doctor of Audiology program

[SL] Courses taught in the Communication Sciences and Disorders Summer SLPA program