Debasish Ray Mohapatra

CONTACT INFORMATION

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Website

RESEARCH INTERESTS

articulatory speech synthesis, computational acoustic, speech-motor control, machine learning

EDUCATION

University of British Columbia, Vancouver, Canada — Jan 2025 (Expected)
Ph.D., Electrical and Computer Engineering
- Advisor: Dr. Sidney Fels, P.Eng.

University of British Columbia, Vancouver, Canada — May 2021
M.A.Sc., Electrical and Computer Engineering
- Thesis: Talking Tube - A novel approach for vocal tract acoustic modelling using the finite-difference time-domain method.
- Advisor: Dr. Sidney Fels, P.Eng.

Siksha 'O' Anusandhan University, Bhubaneswar, India — Aug 2013
B.Tech., Electronics and Communication Engineering
- Project: Image segmentation based on mutual information
- Advisor: Sunita Samant, M.Tech.

WORK EXPERIENCE

Tata Consultancy Service (TCS) — 2014 - 2017
Software Test Engineer
- Designed and executed test scenarios and test cases for the front-end (Web app) and back-end (ETL system) applications using ALM and JIRA test managment tools.
- Designed automated test scripts using HP UFT tool.
- Participated in the functional and regression testings.

RESEARCH EXPERIENCE

VocalTractLab, TU Dresden, Germany — 2022
Visiting Research Intern (June-August)
Project: A comparative analysis of vocal tract centreline determination algorithms.
Advisor: Dr.-Ing. Peter Birkholz

Human Communication Technologies Lab, UBC, Canada — 2018 - Present
Graduate Research Assistant
Project: Vocal tract acoustic modelling using the finite-difference time-domain (FDTD) method.
Advisor: Dr. Sidney Fels, PEng

TEACHING EXPERIENCE

University of British Columbia, Canada
Teaching Assistant
Human-Computer Interfaces in Engineering Design, CPEN 441
Introduction Computation in Engineering Design, APSC 160
Introduction to Microcomputers, CPEN 211

University of British Columbia, Canada
Peer Tutor, Center for Accessibility
Computational Thinking, CPSC 100
Basic Algorithms and Data Structures, CPSC 221

PROJECTS

3D FDTD Vocal Tract Model 2021 - Present
A high-dimensional (3D) vocal tract model for an articulatory speech synthesizer.

Sound Stream 2018
An interactive user interface for producing speech sounds in real-time using an articulatory speech synthesis model (JASS).
Tools Used: JASS STK, Arduino, Slider sensors, Document camera

FELLOWSHIPS & GRANTS

- **Interspeech 2022 Travel Grant** (600 EUR)
  Conference registration and travel grant to Incheon, South Korea
- **UBC Language Sciences Trainee Travel Fund** (3000 CAD)
  Travel fund for short-term visit to TU Dresden, Germany

AWARDS & HONORS

- Go Global Self-Directed Research Award, UBC 2022
  (1500 CAD)
- Graduate Covid Program Delay Tuition Award, UBC 2021
  (1917 CAD)
- President's Academic Excellence Initiative PhD Award, UBC 2021 - Present
  (1545 CAD/year)
- International Tuition Award, UBC 2018 - Present
  (3200 CAD/year)
- Certification of Appreciation for outstanding contribution, TCS 2015

MISCELLANEOUS

Leadership & Volunteer

- **Human Communication Technologies Lab Ambassador**
  Role: Voluntarily worked as the lab representative for the HCT lab, UBC.

Students Mentored

- Anusika Nijher, University of British Columbia, **2021-2022**
  A machine learning approach for mapping vocal tract geometry to acoustic.
- Rongshuai Wu, University of British Columbia, **2022**
  GPU Parallelization of FDTD algorithm to speed-up acoustic simulation.

(PEER-REVIEWED) CONFERENCES & WORKSHOPS PROCEEDINGS

[6] **D. Mohapatra**, M. Fleischer, V. Zappi, P. Birkholz, S. Fels, *"Three-dimensional finite-difference time-domain acoustic analysis of simplified vocal tract shapes"*, Proceedings of Interspeech, 2022 (**Accepted**)

[5] **D. Mohapatra**, P.Saha, Y. Liu, B. Gick, S. Fels, *"Vocal tract area function extraction using ultrasound for articulatory speech synthesis"*, Speech synthesis workshop, 2021, pp.90-95.

[4] **D. Mohapatra**, V. Zappi, S. Fels, *"A comparative study of two-dimensional vocal tract acoustic modeling based on Finite-Difference Time-Domain methods"*, International seminar on speech production, 2020, pp. 154-157.

[3] **D. Mohapatra**, V. Zappi, S. Fels, *"An extended two-dimensional vocal tract model for fast acoustic simulation of single-axis symmetric three-dimensional tubes"*, Proceedings of Interspeech, 2019, pp. 3760-64.

[2] **D. Mohapatra**, S. Fels, *"Limitations of source-filter coupling in phonation"*, Canadian acoustics, 2018, vol 46, No 4, pp. 60-61.

[1] P. Saha, **D. Mohapatra**, Praneeth SV, S. Fels, *"Sound-Stream II: Towards real-time Gesture Controlled articulatory sound synthesis"*, Canadian acoustics, 2018, vol 46, No 4, pp. 58-59.

ABSTRACTS

[2] **D. Mohapatra**, V. Zappi, S. Fels, *"A lightweight physics-based vocal tract acoustic model using the finite-difference time-domain method "*, Complexity in speech production and perception, 2022, pp. 48-49

[1] P.Saha, **D. Mohapatra**, S. Fels, *"Speak with your hands using continuous hand gestures to control articulatory speech synthesizer"*, International seminar on speech production, 2020.