

Benjamin Masters

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Education

University of Waterloo

Ph.D., Systems Design Engineering

88.5 GPA | Expected 2028

Thesis topic: Measurement of effort in conversation

M.A.Sc, Systems Design Engineering

89.8 GPA | 2024

Thesis: Talker sensitivity to turn-taking in conversation

Purdue University

B.S.E., Acoustical Engineering

3.74 GPA | 2022

Research Appointments

University of Waterloo

Graduate Student Researcher, Hearing Lab

Waterloo, ON

Sept. 2022 - Present

- Studying listening effort in interactive conversation through behavioral and physiological responses.
- Developed a method for modeling cognitive effort and attention around turn-taking in conversation.
- Performed an experiment that aimed to understand how talkers perceive effort in conversation.
- Designed a real-time signal processing system for manipulation of speech signals during interactive conversation.

Purdue University

Undergraduate Researcher, Experimental Amplification Research Lab

West Lafayette, IN

Aug. 2021 - May 2022

- Assessed the acoustic directional performance of an open-source hearing aid platform.
- Developed a desktop microphone calibration procedure yielding increased directional accuracy.

Teaching Appointments

University of Waterloo

Sessional Instruction

Waterloo, ON

- BME 252 - Linear Systems & Signals Spring 2025
 - As the sole instructor of this course, responsibilities will include developing and presenting lecture material, assignments, projects, and exams.

Teaching Assistance

- SYDE 552 - Computational Neuroscience Winter 2025
 - Graded and provided support for assignments on computational modeling of neural systems.
- SYDE/MTE 252 - Linear Systems & Signals Spring & Fall 2023, Spring & Fall 2024
 - Hosted weekly tutorials and office hours, and developed and hosted exam review sessions.
 - Designed and held interactive lab sessions to demonstrate applications of course concepts.
 - Graded and provided feedback for exams, quizzes, assignments, and projects.
- SYDE 556/750 - Simulating Neurobiological Systems Fall 2023
 - Marked coursework and held office hours covering simulations of biologically plausible neural networks.
- BME 101 - Communication in Biomedical Engineering Fall 2022
 - Provided feedback and grading to help students develop written, visual, and oral communication skills.

Purdue University

Teaching Assistantships

West Lafayette, IN

- Graded homework and exams covering physical acoustics, noise control methods, and psychoacoustics.

Industry Experience

Bose Corporation

Acoustic Engineer Intern

Framingham, MA

June 2022 - Aug. 2022

- Designed an algorithm to acoustically detect air leaks from loudspeakers during production verification testing.

Starkey Hearing Technologies

Acoustic Engineer Intern

Eden Prairie, MN

May 2021 - Aug. 2021

- Developed vibration sensitivity testing procedures for the electroacoustic transducers used in hearing aids.

Awards

- 1st Place - 2024 International Student Challenge Problem in Signal Processing - Acoustical Society of America
- 1st Place - 2023 International Student Challenge Problem in Signal Processing - Acoustical Society of America
- International Doctoral Student Award - University of Waterloo
- International Masters Award of Excellence - University of Waterloo

Service

- Member - Systems Design/Biomedical Engineering Teaching Assistant Spaces Committee
 - Developed a plan for revitalization of shared departmental teaching assistant spaces, benefiting both teaching assistants and their respective students.
- Treasurer - Purdue Student Chapters of the Acoustical Society of America and Audio Engineering Society
 - Developed weekly workshops and events covering acoustics and audio technology.
 - Received an \$8000 grant to host a loudspeaker building workshop for members, procured parts and components for the workshop, and hosted the event, teaching basic woodworking, soldering, and electrical.

Academic Contributions

Journal Articles

- Masters, B., MacDonald, E. (Submitted). "Variable delay in conversation"
- Masters, B., Aliakbaryhosseinabadi, S., Wendt, D., MacDonald, E. (Submitted). "Pupil responses in interactive conversation"

Conference Presentations

- Masters, B., Aliakbaryhosseinabadi, S., Wendt, D., MacDonald, E. (2024). "Analysis of physiological measures around conversational state changes" Acoustical Society of America 186/Acoustics Week in Canada 2024, Ottawa, Ontario, Canada
- Masters, B., MacDonald, E. (2024). "The effects of delay on task-based interactive conversation" Acoustical Society of America 186/Acoustics Week in Canada 2024, Ottawa, Ontario, Canada

Invited Talks

- Masters, B. (2024) "Talker Sensitivity to Turn-Taking in Conversation", Eriksholm Research Centre
- Masters, B. (2024) "Talker Sensitivity to Turn-Taking in Conversation", Technical University of Denmark