BENJAMIN MASTERS

775-220-8745 · Bpmasters@mac.com· Portfolio

EDUCATION

University of Waterloo — Expected Aug. 2024
Master of Applied Science, Systems Design Engineering — 4.00 GPA
   Teaching Assistant: Systems and Signals, Communication in Biomedical Engineering
   Awards: International Masters Award of Excellence

Purdue University — Aug. 2018 - May 2022
Bachelor of Science in Engineering, Acoustical Engineering — 3.74 GPA
   Teaching Assistant: Noise Control

SKILLS

Acoustics & Audio	Audio Analyzers, Calibration, Test, & Measurement, Modeling, Signal Processing
Design & Analysis	CAD (Creo, AutoCAD), Finite Element Analysis (Abaqus, MATLAB)
Programming	MATLAB, Python, C/C++, Git
Prototyping	3d-Printing, Arduino, Hand Tools, Soldering, Woodworking

WORK EXPERIENCE

Acoustic Engineer Intern — May 2022 - Aug. 2022
Bose Corporation — Framingham, MA, USA

- Designed an algorithm and testing procedure to detect air leaks from active loudspeaker systems in a production environment that yielded a greater than 20% increase in the accuracy of identification of this defect.
- Integrated the algorithm into an end-of-line testing suite using the Audio Precision API and MATLAB enabling further automation of production and the reduction of subjectivity in the quality assurance process.

Acoustic Engineer Intern — May 2021 - Aug. 2021
Starkey Hearing Technologies — Eden Prairie, MN, USA

- Innovated upon an industry standard vibration sensitivity test for sub-miniature microphones using a shaker, accelerometer, R&S audio analyzer, and Python to enable accurate testing of a new design configuration.
- Designed a vibration testing procedure for balanced armature receivers using a Polytec scanning laser and SoundCheck and developed a visualization tool in MATLAB to allow for simple device characterization.

RESEARCH EXPERIENCE

Graduate Speech and Hearing Systems Researcher — Sept. 2022 - Present
University of Waterloo, Speech, Communication, and Hearing (SpeeCH) Lab — Waterloo, ON, CA

- Built a conversational analysis framework using Python that identifies the state of a conversation in real time, tracks statistical parameters of speech perception and production, performs data acquisition, and allows for inclusion of custom processing modules to enable comprehensive testing of conversational dynamics.
- Developed an algorithm to implement controlled variable delays in communication lines between speakers in real time, and integrated it into the framework to test behavioral response to delays in conversation.
- Implementing a linear predictive coding based real-time formant estimation and perturbation algorithm to test adaption of speech based on communicative intent.

Undergraduate Hearing Science Researcher — Aug. 2021 - May 2022
Purdue University, Experimental Amplification Research (EAR) Lab — West Lafayette, IN, USA

- Conducted an experiment to measure the directional capabilities of an Arduino/Teensy based open-source hearing assistive platform using signal processing and simulated in-ear measurements that followed relevant standards.