Valerie Rennoll

Electrical engineering graduate student

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Education

Johns Hopkins University
Baltimore, MD

Ph.D. Electrical and Computer Engineering — *2016-present*

- Dr. Jim West's Research Group

American University
Washington, DC

Bachelor of Science in Audio Technology and Physics, GPA: 3.98 — *2012-2016*

- Honors Program Participant

Skills

Programming languages	Matlab, Mathematica, Python, R, Arduino, LaTeX, Java
Software	JMP, Minitab, SolidWorks, Pro Tools, Logic Pro, Microsoft Office
Material fabrication & characterization	Electrospinning, corona charging, SEM, XRD, FTIR, electrostatic voltmeter
Design	Illustrator, Procreate
Other	Design of experiments, time management, technical writing

Research Experience

Graduate Student
Baltimore, MD

Johns Hopkins University — *July 2016 - PRESENT*

- Optimizing electret polymers for use in flexible, acoustic impedance-matched transducers
- Generating statistical model that determines the fabrication conditions for a polymer to demonstrate specific acoustic properties
- Developing signal processing method to make electronic stethoscopes sound more comparable to acoustic stethoscopes
- Studying how biomolecules can be used to enhance the electrical response of polymers

Audio Technology Capstone
Washington, DC

American University — *Jan. 2016 - May 2016*

- Applied delay-sum beamforming to Playstation Kinect and handmade microphone array

Senior Physics Thesis
Washington, DC

American University — *Aug. 2015 - May 2016*

- Constructed demonstrations to explain acoustics concepts, such as interference between and diffraction of waves

Research Intern
Silver Spring, MD

NOAA Office of Coast Survey — *May 2015 - Aug. 2015*

- Analyzed approximately 2 terabytes of acoustical depth data for ocean floor mapping in the Arctic
- Created new workflow for the Office of Coast Survey to ingest bathymetric data from outside sources
- Utilized sonar for acoustic data collection onboard NOAA Ship *Fairweather*

Research Assistant
Washington, DC

American University — *Feb. 2014 - Aug. 2014*

- Measured thermal noise in optical coatings for use in the Laser Interferometer Gravitational-Wave Observatory

Research Intern
Culpeper, VA

Applied Research in Acoustics — *June 2014 - Aug. 2014*

- Performed subject matter expert playtesting of WaveQuest, an educational underwater acoustics video game
- Developed parametric underwater noise models as part of real-time passive sonar simulation engine

Teaching Experience

Adjunct Lecturer
Baltimore, MD

Peabody Institute — *Aug. 2021 - Dec. 2021*

- Designed and led an introductory, graduate-level musical acoustics course
- Implemented active learning through semester-long research project to characterize acoustic sensor

Course Instructor
Baltimore, MD

Johns Hopkins University — *Aug. 2020 - Dec. 2020*

- Developed and led an introductory course on electret materials for freshman undergraduates
- Prepared class demonstrations and coordinated six guest lecturers

Teaching Academy Participant
Baltimore, MD

Johns Hopkins University — *Aug. 2019 - Dec. 2020*

- Completed certificate program that provided formal instruction on pedagogy and evidence-based teaching practices

Guest Lecturer
Baltimore, MD

Johns Hopkins University — *Spring 2020*

- Developed and provided guest lectures on the electronic properties of materials for a graduate level course

Physics Teaching Assistant
Washington, DC

American University — *Jan. 2013 - May 2016*

- Held regular office hours to support students in understanding class content
- Assessed weekly homework assignments of approximately fifty students

Work Experience

Dipole Materials
Baltimore, MD

Lab Technician — *Apr. 2020 - May 2020*

- Produced electrospun nanofiber mats for use as face mask filters
- Performed quality control checking of filter material and troubleshot instrument complications

Shen Milsom & Wilke
Washington, DC

Acoustic Consultant Intern — *Sep. 2015 - Dec. 2015*

- Composed reports for clients addressing potential acoustic issues and how to mitigate architectural impacts
- Conducted site visits for the collection of sound measurement data

Sound Foundation
Culpeper, VA

Nonprofit Intern — *June 2014 - Aug. 2014*

- Gathered research to form case of support for the nonprofit, which introduces disadvantaged high school students to STEM and business fields through real-world acoustics projects
- Designed program structure and lessons based on pedagogical research

Shrewsbury Township
Glen Rock, PA

Administrative Intern — *Aug. 2011 - May 2014*

- Constructed and maintained database to organize approximately 600 sewer maps
- Executed administrative duties such as filing, updating website, and creating newsletter

Camp Superkids with Johns Hopkins Bayview Medical Center
New Freedom, PA

Camp Counselor — *July 2013*

- Organized and led a weeklong music workshop for children to write and record their own song

Publications

Rennoll, V., McLane, I., Eisape, A., Grant, D., Elhilali, M., West, J..”Design of an electrostatic transducer with acoustic impedance matching through an optimal design of experiments.” In preparation.

Rennoll, V., Lee, S., Erturun, U., Fried, S., West, J. “DNA increases the β–phase content of PVDF films.” CEIDP, 2020.

Rennoll, V., McLane, I., Emmanouilidou, D., West, J., Elhilali, M. “Electronic stethoscope filtering mimics the perceived sound characteristics of acoustic stethoscope.” JBHI, 2020.

Fischl, K.D., Tognetti, G., Mendat, D., Orchard, G., Rattray, J., Sapsanis, C., Campbell, L., Elphage, L., Niebur, T., Pasciaroni, A., **Rennoll, V.**, Romney, H., Walker, S., Pouliquen, P., Andreou, A. “Neuromorphic self-driving robot with retinomorphic vision and spike-based processing/closed-loop control.” CISS, 2017.

Patents

Rennoll, V., McLane, I., Eisape, A., Elhilali, M., West, J. Impedance-matched acoustic transducer, Filed JHU Invention Disclosure, C16430, Oct. 9, 2020.

McLane, I., West, J., Emmanouilidou, D., Elhilali, M., **Rennoll, V.**, Erturun, U., Orrego, S., Kang, SH. Tunable thin- film acoustic sensor, manufacturing methods, and processing algorithms, Filed JHU Invention Disclosure, D14834, July 7, 2017.

Presentations

ASA Acoustics in Focus *virtual; June 2021*

Evaluating the impact of acoustic impedance matching on the airborne noise rejection and sensitivity of an electrostatic transducer

Acoustics Virtually Everywhere *virtual; Dec. 2020*

Characterizing the acoustic impedance and attenuation of biocompatible elastomers: an optimal design of experiments approach

CEIDP *virtual; Oct. 2020*

DNA increases the β–phase content of PVDF films

MRS Fall Meeting *Boston, MA; Dec. 2019*

Assessing the individual contributions of dipolar, trapped, and triboelectric charges to electrospun PVDF’s electrical response

Posters

JMP Discovery Summit *virtual; Oct. 2021*

Design of experiments to characterize and predict polymer acoustic properties

Johns Hopkins Dept. of Medicine & Whiting School of Engineering Research Retreat *virtual; Mar. 2021*

Electrostatic transducer with tuned mechanical properties for improved body sound sensing

APS March Meeting *Baltimore, MD; Mar. 2016*

Visualizing Sound: Demonstrations to Teach Acoustic Concepts

Ocean Sciences Meeting *New Orleans, LA; Feb. 2016*

Data Mining to Chart the Arctic: Analysis of Approaches to Incorporate Outside Source Data into NOAA Office of Coast Survey Workflow

Honors

Acoustical Society of America, DC Chapter, Oral Presentation Award	*May 2021*
Collegiate Inventors Competition Runner Up Award	*Oct. 2020*
Johns Hopkins Discovery Award	*Summer 2019*
IEEE Dielectrics and Electrical Insulation Society Graduate Student Fellowship	*Dec. 2019*
Maryland State Three Minute Thesis Competition, Audience's Choice	*May 2019*
Johns Hopkins University Three Minute Thesis Competition, 2nd Place	*Apr. 2019*
Phi Beta Kappa Member	*Spring 2016*
Outstanding Academics in Audio Technology, American University	*Spring 2014-2016*
Honors and Scholars Program Outstanding Senior, American University	*Spring 2016*
Outstanding Physics Academics, American University	*Spring 2013-2014, 2016*
Honors Capstone Research Grant, American University	*Fall 2015*
Acoustical Society of America, DC Chapter, Oral Presentation Award	*May 2015*
Barry Goldwater Scholarship Honorable Mention	*Spring 2015*
Honors Scholars and Artists Award, American University	*Spring 2015*
Physics Teaching Assistant Award, American University	*Spring 2015*
NOAA Hollings Scholar	*2014-2016*
Dean's List, American University	*2012-2016*
Dean's Scholarship, American University	*2012-2016*
Girl Scout Gold Award	*2012*

Leadership

Stevenson University Expanding Your Horizons: STEM Discovery Day *Owings Mills, MD; Sept. 2017-2019*
Designed and led workshops introducing participants to the science of sound and construction of a speaker

Southern Elementary School Science Friday *Glen Rock, PA; Apr. 2018*
Co-organized event and coordinated over twenty volunteers to introduce elementary students to STEM fields

Girl Scout GENIUS Day *New Freedom, PA; Apr. 2017*
Co-organized event to introduce 130 girls to variety of STEM fields through hands-on workshops

USA Science and Engineering Festival *Washington, DC; Apr. 2014 & 2016*
Interacted with the public to explain the science of sports and sound at American University's booth

National Maker Faire *Washington, DC; June 2015*
Showed and explained audio spectrum analyzer project to the public at American University's booth

Activities

Electrical and Computer Engineering Graduate Student Association President *Fall 2021*
Lead and organize events to engage the graduate student community, including lunch and learns, outreach, and study breaks

Revision editor *Spring 2021*
Provide editing services to the JHU research community for manuscripts, grant applications, and personal statements

Womxn Mentoring Whiting mentor *Spring 2021*
Paired with undergraduate engineering student to provide support with internship and graduate school applications

STEM Achievement in Baltimore Elementary Schools (SABES) program mentor *Fall 2019*
Assisted students in completing student-driven STEM projects during afterschool program

Southern York County School District STEAM Committee *Fall 2017 - Spring 2018*
Implemented activities to increase scientific thinking throughout the school district

Audio Technology Professor Search Committee *Fall 2015*
Interviewed potential candidates as student member of committee

Women in Science *June 2015*

Coordinated and led multiple events including a Girl Scout outreach day, Professor Potluck, Fall Social, Alumni Panel, and luncheon with Associate Director for Science at the White House