

Valerie Rennoll

ELECTRICAL ENGINEERING GRADUATE STUDENT

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Education

Johns Hopkins University

PH.D. ELECTRICAL AND COMPUTER ENGINEERING

- Dr. Jim West's Research Group

Baltimore, MD

2016-present

American University

BACHELOR OF SCIENCE IN AUDIO TECHNOLOGY AND PHYSICS, GPA: 3.98

- Honors Program Participant

Washington, DC

2012-2016

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

JOHNS HOPKINS UNIVERSITY

- 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

Baltimore, MD

July 2016 - PRESENT

Audio Technology Capstone

AMERICAN UNIVERSITY

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

Washington, DC

Jan. 2016 - May 2016

Senior Physics Thesis

AMERICAN UNIVERSITY

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

Washington, DC

Aug. 2015 - May 2016

Research Intern

NOAA OFFICE OF COAST SURVEY

- 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*

Silver Spring, MD

May 2015 - Aug. 2015

Research Assistant

AMERICAN UNIVERSITY

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

Washington, DC

Feb. 2014 - Aug. 2014

Research Intern

APPLIED RESEARCH IN ACOUSTICS

- 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

Culpeper, VA

June 2014 - Aug. 2014

Teaching Experience

Course Instructor

JOHNS HOPKINS UNIVERSITY

Baltimore, MD

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

JOHNS HOPKINS UNIVERSITY

Baltimore, MD

Aug. 2019 - Dec. 2020

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

Guest Lecturer

JOHNS HOPKINS UNIVERSITY

Baltimore, MD

Spring 2020

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

Physics Teaching Assistant

AMERICAN UNIVERSITY

Washington, DC

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

LAB TECHNICIAN

Baltimore, MD

Apr. 2020 - May 2020

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

Shen Milsom & Wilke

ACOUSTIC CONSULTANT INTERN

Washington, DC

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

NONPROFIT INTERN

Culpeper, VA

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

ADMINISTRATIVE INTERN

Glen Rock, PA

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

CAMP COUNSELOR

New Freedom, PA

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

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

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