JULIANA PATRICIA BENAVIDES LARA

jbenav6@uic.edu

EDUCATION

PhD Biomedical Engineering 2021 - Present
University of Illinois at Chicago. GPA: 4.0

Master of Physics 2017 - 2021
Universidad Nacional de Colombia. GPA: 4.0

Physics 2012 - 2017
Universidad Nacional de Colombia. GPA: 3.5

JOURNAL PUBLICATIONS

Benavides-Lara, J., Prakash R., Avanaki, K. Assessment of a Single-Element Scanning System for Enhanced Photoacoustic Imaging of Brain Hemorrhage. Journal of Biophotonics. IF = 3.4.

Benavides-Lara, J., Manwar, R., Tsoukas M., Siegel A., Avanaki, K. High-Frequency Photoacoustic and Ultrasound Imaging for Skin Evaluation: Application to Assessment of Chemical Burns. 2024. Journal of Biophotonics. IF = 3.4.

Fakhoury J.** **Benavides-Lara, J.****, Manwar, R., Zafar M., Xu Q., Engel R., Tsoukas M., Daveluy S., Mehregan D., Avanaki, K. Exploring Photoacoustic Imaging for Cutaneous Melanoma Assessment: A Comprehensive Review. 2024. Journal of Biomedical Optics. ****Co-first author**. IF = 3.5.

Benavides-Lara, J., Manwar, R., McGuire, L., Islam, T., Shoo, A., Charbel, F., Menchaca M., Siegel A., Pillers D., Gelovani J., Avanaki, K. Transfontanelle photoacoustic imaging of intraventricular brain hemorrhages in live sheep. 2023. Photoacoustics. IF = 9.7.

Lee, J., **Benavides, J.**, Manwar, R., Puyana, C., May, J., Tsoukas, M., Avanaki, K. Noninvasive imaging exploration of phacomatosis pigmentokeratotica using high-frequency ultrasound and optical coherence tomography: Can biopsy of PPK patients be avoided?. 2023. Skin Research and Technology. IF = 2.2.

Manwar R, **Benavides J.P.**, Prakash R, Ranjbaran SM, Avanaki K. Randomized multi-angle illumination for improved linear array photoacoustic computed tomography in brain. 2022. Journal of Biophotonics. IF = 3.4.

J. A. Cuervo Farfán, **J. P. Benavides Lara**, D. A. Landínez Téllez, J. Roa-Rojas. Structural Characteristics and Electric and Magnetic Features of the $Nd_{2.68}Sr_{1.32}Mn_{1.2}Ti_{1.32}Fe_{1.48}O_{12}$ Ferromagnetic Semiconductor. 2020. Journal of Low Temperature Physics. IF = 2.0.

CONFERENCE PROCEEDINGS

Benavides J.P., Tsoukas, M., Avanaki, K. (2024, March). Tumor assessment system using high frequency ultrasound and photoacoustic imaging: system development. In Photons Plus Ultrasound: Imaging and Sensing 2024. SPIE.

Prakash, R., **Benavides J.P.**, Avanaki, K. (2024, March). Evaluation of multispectral unmixing algorithm for HbO2 and HbR. In Photons Plus Ultrasound: Imaging and Sensing 2024. SPIE.

Islam, M. T., **Benavides J.P.**, Prakash, R., McGuire, L., Charbel, F., Lin, J., Avanaki, K. (2024, March). Development of a thermoacoustic imaging system to image blood in the brain: preliminary ex-vivo results. In Photons Plus Ultrasound: Imaging and Sensing 2024. SPIE.

Benavides J.P., Demirkan, I., Tsoukas, M., Avanaki, K. (2023, March). Implementing the quantitative study of ultrasound imaging of skin. In Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series.

Manwar, R.,**Benavides J.P.**, Prakash, R., Avanaki, K. (2023, March). Adjustable light illumination for linear array photoacoustic computed tomography. In Photons Plus Ultrasound: Imaging and Sensing 2023. SPIE.

J.P. Benavides, Y. Mejía Barbosa. (2019, March). Characterization of a line of light width with axial displacements for a triangulation system. Poster session at IONS Orlando 2019 Conference, Orlando, Florida.

J.P. Benavides, J. A. Cuervo, C. A. Parra, D. A. Landinez, J. Roa Rojas. (2017, October). Ferromagnetic behavior at room temperature in the perovskite type material Nd2SrMn2Tio9 due to the substitution of Fe+3 in the B site of the crystal structure. Poster session at XXVI National Conference of Physics.

C. D. Gutiérrez, D. L. Ramos, D. L. Bernal, H. Córdoba, J. E. Pérez, **J.P. Benavides**, N. P. Neira, S. Serrano, M. Ríos N., S. Torres G. A. Mendoza. (2013, August). Use of physical techniques in the evaluation of Colombian mineralogical material. Poster session at XXV National Conference of Physics.

ACADEMIC PRESENTATIONS

4th annual UIC Biomedical Engineering Symposium 2022
University of Illinois at Chicago
In vivo, skin morphological study using non-invasive high-resolution dual-modality ultrasound and photoacoustic.

UIC Skin Imaging Symposium 2022
University of Illinois at Chicago
In vivo photoacoustic/ultrasound imaging study of the skin.

5th annual UIC Biomedical Engineering Symposium 2023
University of Illinois at Chicago
In vivo photoacoustic/ultrasound imaging study of healthy skin and lesion healing process.

UIC Three Minute Thesis Competition 2023
University of Illinois at Chicago
Can we see the sound?

15th International Newborn Brain Conference 2024
Cork, Ireland
Intraventricular Brain Hemorrhage Detection through Transfontanelle Photoacoustic Imaging: An Innovative Approach.

6th annual UIC Biomedical Engineering Symposium 2024
University of Illinois at Chicago
A Non-invasive Tumor Margin Assessment System Using High Frequency Ultrasound and Photoacoustic Imaging

HONORS AND AWARDS

Recipient of the Fall 2023 Award for Graduate Research 2023
University of Illinois at Chicago

Award received for the project "Transcranial Photoacoustic Imaging for Enhance Neonatal Brain Hemorrhaging".

First place in oral presentation competition - Biomedical Imaging Symposium 2023
University of Illinois at Chicago
Presentation: "In vivo photoacoustic/ultrasound imaging study of healthy skin and lesion healing process".

Second place in the presentation competition - Skin Imaging Symposium 2022
University of Illinois at Chicago
Presentation: "In vivo photoacoustic/ultrasound imaging study of the skin".

Third place in the National Physics Tournement 2019
National Physics Tournement
Representation of National University (Bogota) in the National Physics Tournement.

Second place in poster presentation competition 2017
Universidad Nacional de Colombia
Presentation for undergraduate thesis work: Production and study of the structure, ferromagnetic and electric response of the Nd2.68Sr1.32Mn1.2Ti1.32Fe1.48O12.

RESEARCH EXPERIENCE

Resercher Assitant August 2021 - Present
Optical and Photoacoustic Imaging Research and Analysis Laboratory
Exploring and implementing photoacoustic tomography systems for skin and brain imaging, including animal experiments ex vivo and in vivo with mice, rats, and sheep.

Resercher May 2018 - May 2021
Applied Optics Group
I was involved in implementing an experimental triangulation method to reconstruct a lens contact surface using white light fringe projection. I also worked on digital image processing to measure the fringe of light and developed algorithms to measure its shift due to the surface.

Resercher October 2017 - May 2018
Applied Optics Group
I was involved in constructing and calibrating the amplitude of a Mach-Zehnder interferometer in a vertical orientation for digital holographic microscopy. Additionally, I developed algorithms based on Fourier Optics Theory to reconstruct holograms. I also conducted preliminary measurements for phase calibration and measured the size of cells in a blood sample.

Resercher December 2015 - March 2017
Novel Materials Physics Group
I have expertise in producing novel materials and analyzing their chemical composition, structure, and electric and magnetic properties. I have applied the solid-state technique for material production and utilized the fundamentals of crystallography to study structure using x-ray diffraction.

Resercher September 2012 - October 2014
Magnetic materials and Nanostructures
I studied the composition, structure, electric, and magnetic properties of various materials, including rocks and synthetics. I also conducted extraction and treatment of geological materials for property analysis.

TEACHING AND MENTORING EXPERIENCE

Mentoring high school students June 2023 - August 2023
OPIRA Lab
I assisted student Jayvyn McKee in participating in the ultrasound and photoacousic imaging of hemorrhages in sheep brains.

Mentoring ungraduate students February 2022 - October 2022
OPIRA Lab
I assisted student Noor Alghafeer in actively participating in the creation and optimization of experimental protocols for developing ultrasound phantoms.

Calculus and Physics Tutor March 2015 - 2021
Tutor.com
I tutor students in physics and calculus at the high school and college levels.

Student Assistant August 2017 - December 2017
Autonomous Study Group in National University of Colombia.
I tutor and help students at the university with science and engineering problems.

UNIVERSITY SERVICE

Research lab visitor coordinator OPIRA lab 2022 - Present
OPIRA Lab in University of Illinois at Chicago.
I conducted guided tours and facilitating visits for high school students to the OPIRA Lab, showcasing research projects and engaging in interactive discussions to increase their interest in biomedical imaging.

Student Assistant Feburary 2018 - October 2019
Vice-Rector of Research in National University of Colombia.
I supported the administration by handling contract, tickets, and order requirements for the University.

Student Assistant February 2017 - July 2017
Physics Department of National University of Colombia.
I was responsible for preparing and managing the laboratories for science and engineering students.

Student Assistant February 2016 - July 2016
Office of National Direction of Admissions in the National University of Colombia.
I supported the call center operations, answering questions about the admission process and assisting with logistics for the admission exam at the main campus of the University in Bogota.

PEER-REVIEW

Biomedical Optics Express ISSN: 2156-7085. Reviewed Paper Number: 3
Frontiers in neuroscience ISSN 1662-453X. Reviewed Paper Number: 1
Scientific Reports ISSN 2045-2322. Reviewed Paper Number: 2

CERTIFICATIONS

Python for Everybody, a 5-course specialization by University of Michigan on Coursera. Specialization Certificate earned on August 19, 2020.

TECHNICAL SKILLS

Programming languages and mathematical packages: Matlab, Python, C++
Computer aided design/engineering: AutoCAD, OSLO, Origin Pro.
Application packages: MS Office, Illustrator.

LANGUAGES

Spanish: Native Language ; English: Proficent