

JHON A. CASTRO-CORREA

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🌐 [Research website](#) ◊ [Google Scholar](#) ◊ [LinkedIn](#) ◊ [ResearchGate](#) ◊ [GitHub](#)

EDUCATION [in](#) [id](#)

Doctorate in Electrical and Computer Engineering December 2024 (expected)
University of Delaware

Research: Investigating the acoustic propagation underwater via graph signal processing and graph convolutional networks.

Master in Electrical and Computer Engineering Summer 2022
University of Delaware

Thesis: Dictionary learning for sparse representation and classification of sound speed profiles in the ocean.

GPA: 3.92/4.0

Bachelor of Electronics Engineering March 2018
Universidad Francisco de Paula Santander

Thesis: A geolocation system through GSM/GPRS protocol for public transportation in Cucuta. Laureate thesis (5.0/5.0)

GPA: 4.74/5.0

AWARDS

Graduated with honors from the Data Science For All (DS4A) Colombia 2022 cohort taught by Correlation One - 375 hours - ([online certification](#)).

Awarded with a one-year internship as a young Researcher Colciencias. Colombia, 2018-2019.

Highest Saber Pro score (National Undergraduate Program Quality Test), ranked in the country's top 0.7% (amongst 242,629 applicants)

Full scholarship (tuition waiver) during the entire undergraduate program because of the high-grade point average (4.74/5.00).

First place in general grade point average among +500 students in the Electronic Engineering program. Laureate thesis. February 12th, 2018 (5.00/5.00).

EXPERIENCE [in](#) [id](#)

University of Delaware February 2019 - Present
Graduate research assistant

- Ocean and environmental characterization based on signal processing and deep learning algorithms.
 - Reconstruction of the underwater environment using graph signal processing and graph convolutional neural networks.
 - Acoustic source localization using graph-based neural networks.
 - Dictionary learning for sparse representation of sound speed profiles in the ocean.

- Investigation of the acoustic signal propagation in the presence of internal waves in the water column.
- Source localization and environment classification of the seabed using broadband signals and deep learning (convolutional neural networks and residual networks).

University of Delaware

June 2018 - November 2018

Visiting research scholar

- Diamond sampling applied to x-ray coded aperture optimization
- Sponsor: Electrical & Computer Engineering Department - University of Delaware.
 - Use of sampling and probabilistic theory on the coded aperture optimization.
 - Theoretical analysis of the complexity of the diamond sampling versus current approaches.
 - Comparison of time, memory, and performance between coded aperture optimization with Diamond Sampling versus state-of-the-art and other approaches.

GIDET research group member

January 2017 - June 2019

Researcher

- A geolocation system through GSM/GPRS protocol for public transportation in the city of Cucuta
- Sponsor: Universidad Francisco de Paula Santander. Contract number 012-2017
 - Artificial neural networks to optimize public transport routes using MATLAB.
 - Design and implementation of a geolocation prototype using low-cost technologies.

Universidad Francisco de Paula Santander

January 2017 - January 2018

Undergraduate researcher

- Undergraduate capstone research project.
- Sponsor: Universidad Francisco de Paula Santander. Contract number 012-2017
 - Use of internet communication protocols and applications in real-time.
 - Development of web services and user interfaces to show the values of a process in real-time.

TEACHING  

University of Delaware

February 2023 - Present

Teaching Assistant

- Teaching assistant in ELEG418 Digital Control Systems and ELEG306 Digital Signal Processing courses.
 - Student advisory in class and during office hours.
 - Course structuring and explanation of coding sections in the courses.
 - Grading of assignments, quizzes, and exams.

Universidad Francisco de Paula Santander

August 2016 - December 2017

Teaching Assistant

- Tutor at the social academic program for student permanence where I advised undergraduate students in areas such as calculus, physics, programming, and linear algebra in the Electrical Engineering program.
 - Using pedagogical practices for teaching, oriented to electronic engineering students.
 - Strengthening knowledge in basic sciences such as calculus, linear, and physics.

J. A. Castro-Correa, Mohsen Badiy, J. H. Giraldo, and Fragkiskos D. Malliaros, "Self-supervised Pre-training and Graph-based Learning for Source Localization in Underwater Acoustics", *Acoustical Society of America*, (to be submitted).

P. A. Castro-Correa, S. Rojas-Ortega, S. B. Sepúlveda-Mora, **J. A. Castro-Correa**, "An ensemble learning algorithm for short-term solar and wind energy production forecast in a microgrid", *Energy*, (under review).

J. H. Giraldo, **J. A. Castro-Correa**, Mohsen Badiy, Fragkiskos D. Malliaros, and Thierry Bouwmans, "S2-GNN: Sparse Sobolev Graph Neural Networks", *IEEE Transactions on Signal and Information Processing over Networks*, (under review).

J. A. Castro-Correa, J. H. Giraldo, Mohsen Badiy, and Fragkiskos D. Malliaros, "Gegenbauer Graph Neural Networks for Time-varying Signal Reconstruction", *IEEE Transactions on Neural Networks and Learning Systems*, (Accepted).

J. A. Castro-Correa, S. Arnett, T. B. Neilsen, L. Wan, and M. Badiy, "Supervised classification of sound speed profiles via dictionary learning", *Journal of Atmospheric and Oceanic Technology*, vol. 40, no. 1, pp. 99-112, 2023. DOI: [10.1175/JTECH-D-21-0090.1](https://doi.org/10.1175/JTECH-D-21-0090.1).

J. A. Castro-Correa, S. B. Sepulveda-Mora, B. Medina-Delgado, C. D. Escobar-Amado, and D. Guevarra-Ibarra, "A forest fire monitoring and detection system based on wireless sensor networks", *Scientia et Technica*, vol. 27, no. 2, pp. 89-96, 2022. DOI : [10.22517/23447214.24784](https://doi.org/10.22517/23447214.24784).

J. A. Castro-Correa, M. Badiy, T. B. Neilsen, D. P. Knobles, and W. S. Hodgkiss, "Impact of data augmentation on supervised learning for a moving mid-frequency source," *The Journal of the Acoustical Society of America*, vol. 150, no. 5, pp. 3914–3928, 2021. DOI : [10.1121/10.0007284](https://doi.org/10.1121/10.0007284).

C. D. Escobar-Amado, T. B. Neilsen, **J. A. Castro-Correa**, D. F. Van Komen, M. Badiy, D. P. Knobles, and W. S. Hodgkiss, "Seabed classification from merchant ship-radiated noise using a physics-based ensemble of deep learning algorithms," *The Journal of the Acoustical Society of America*, vol. 150, no. 2, pp. 1434–1447, 2021. DOI: [10.1121/10.0005936](https://doi.org/10.1121/10.0005936).

T. B. Neilsen, C. Escobar-Amado, M. C. Acree, W. S. Hodgkiss, D. F. Van Komen, D. P. Knobles, M. Badiy, and **J. Castro-Correa**, "Learning location and seabed type from a moving mid-frequency source," *The Journal of the Acoustical Society of America*, vol. 149, no. 1, pp. 692–705, 2021. DOI: [10.1121/10.0003361](https://doi.org/10.1121/10.0003361).

J. A. Castro-Correa, S. B. Sepúlveda-Mora, B. Medina-Delgado, D. Guevara-Ibarra, and O. López-Bustamante, "Sistema de geolocalización de vehículos a través de la red gsm/gprs y tecnología arduino," *Revista EIA*, vol. 16, no. 31, pp. 145–157, 2019. DOI: [10.24050/reia.v16i31.1269](https://doi.org/10.24050/reia.v16i31.1269).

J. A. Castro-Correa, S. B. Sepúlveda-Mora, B. Medina-Delgado, and D. Guevara-Ibarra, "Servicio web para la geolocalización de los vehículos de transporte público en la ciudad de Cúcuta," *Respuestas*, vol. 23, no. 1, pp. 29–37, 2018. DOI: [10.22463/0122820X.1498](https://doi.org/10.22463/0122820X.1498).

Tracianne B. Neilsen, B. Wu, C. E. Dobbs, C. A. Escobar-Amado, **J. A. Castro-Correa**, M. Badiy, D. F. Van Komen, D. P. Knobles, and W. S. Hodgkiss, "Comparison of seabed classification using unsupervised and supervised learning on ship noise spectrograms" *OCEANS 2023*, Limerick, Ireland, pp. 1-7, 2023. DOI: [10.1109/OCEANSLimerick52467.2023.10244373](https://doi.org/10.1109/OCEANSLimerick52467.2023.10244373).

J. A. Castro-Correa, J. Giraldo, A. Mondal, M. Badiy, T. Bouwmans, and F. D. Malliaros, "Time-varying Signals Recovery via Graph Neural Networks" *2023 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Rhodes Island, Greece, 2023, pp. 1-5, 2023. DOI: [10.1109/ICASSP49357.2023.10096168](https://doi.org/10.1109/ICASSP49357.2023.10096168).

M. Badiy, L. Wan, C. D. Escobar-Amado, and **J. A. Castro-Correa** "Extraction of seabed properties in mid-frequency range using waveguide invariant applied to broadband signals," *Proceedings of Meetings on Acoustics*, 45, 070003, 2021. DOI: [10.1121/2.0001532](https://doi.org/10.1121/2.0001532).

CONFERENCE PRESENTATIONS

Graph Neural Networks for source localization using Ships-Of-Opportunity spectrograms
December 2023

- **J. A. Castro-Correa**, M. Badiy, J. H. Giraldo, and Fragkiskos D. Malliaros, "Graph Neural Networks for source localization using Ships-Of-Opportunity spectrograms," *Acoustics 2023 Sydney*.

Dictionary learning for classification of sound speed profile in the ocean December 2022

- **J. A. Castro-Correa**, M. Badiy, and L. Wan, "Dictionary learning for classification of sound speed profile in the ocean," *The Journal of the Acoustical Society of America*, vol. 152, no. 4, pp. A212–A212, 2022. DOI: [10.1121/10.0016045](https://doi.org/10.1121/10.0016045).

Broadband acoustic wave propagation in temporally variable range dependent shallow water environment
December 2022

- M. Badiy, L. Wan, **J. A. Castro-Correa**, and D. Escobar-Amado, "Broadband acoustic wave propagation in temporally variable range dependent shallow water environment," *The Journal of the Acoustical Society of America*, vol. 152, no. 4, pp. A145–145, 2022. DOI: [10.1121/10.0015839](https://doi.org/10.1121/10.0015839).

Seabed classification and source localization from ship spectrograms using deep learning models
December 2021

- **J. A. Castro-Correa**, C. D. Escobar-Amado, M. Badiy, T. B. Neilsen, and D. P. Knobles, "Seabed classification and source localization from ship spectrograms using deep learning models," *The Journal of the Acoustical Society of America*, vol. 150, no. 4, pp. A315–A315, 2021. DOI: [10.1121/10.0008416](https://doi.org/10.1121/10.0008416).

Extraction of seabed properties in mid-frequency range using waveguide invariant applied to broadband signals
December 2021

- M. Badiy, L. Wan, C. D. Escobar-Amado, and **J. A. Castro-Correa**, "Extraction of seabed properties in mid-frequency range using waveguide invariant applied to broadband signals," *The Journal of the Acoustical Society of America*, vol. 150, no. 4, pp. A281–A281, 2021. DOI: [10.1121/10.0008300](https://doi.org/10.1121/10.0008300).

Extending machine learning to irregular domains. Theory and applications of Graph Neural Networks.
September 2021

- **J. A. Castro-Correa**. "Extending machine learning to irregular domains. Theory and applications of Graph Neural Networks.". *VII Latin American Congress of Systems and Computer Engineering*, CIDE. Quito, Ecuador, 2021.

Incidence of data augmentation in machine learning using broadband spectrograms June 2021

- **J. A. Castro-Correa**, M. Badiy, T. B. Neilsen, and D. P. Knobles, "Incidence of data augmentation in machine learning using broadband spectrograms," *The Journal of the Acoustical Society of America*, vol. 149, no. 4, pp. A114–A114, 2021. DOI: [10.22463/0122820X.1498](https://doi.org/10.22463/0122820X.1498).

Seabed classification from ship-radiated noise using an ensemble deep learning June 2021

- C. D. Escobar-Amado, M. Badiy, N. T. B, and **J. A. Castro-Correa**, “Seabed classification from ship-radiated noise using an ensemble deep learning,” *The Journal of the Acoustical Society of America*, vol. 149, no. 4, pp. A113–A113, 2021. DOI : [10.1121/10.0004687](https://doi.org/10.1121/10.0004687).

Effect of environmental uncertainty on source localization from mid-frequency tonals using convolutional neural networks. December 2020

- T. B. Neilsen, C. D. Escobar-Amado, M. C. Acree, H. W., V. K. D. F., K. D. P., M. Badiy, and **J. A. Castro-Correa**, “Effect of environmental uncertainty on source localization from mid-frequency tonals using convolutional neural networks,” *The Journal of the Acoustical Society of America*, vol. 148, no. 4, pp. 2544–2544, 2020. DOI: [10.1121/1.5147063](https://doi.org/10.1121/1.5147063)

Use of Artificial Intelligence and the Internet of Things to Detect and Prevent Forest Fires September 2020

- **J. A. Castro-Correa**. ”Use of Artificial Intelligence and Internet of Things to Detect and Prevent Forest Fires”. *VI Latin American Congress of Systems and Computer Engineering*, CIDE. Quito, Ecuador, 2020.

Web service for the geolocation of public transportation vehicles in the city of Cucuta November 2017

- **J. A. Castro-Correa**, S. B. Sepúlveda-Mora, B. Medina-Delgado, and D. Guevara-Ibarra. ”IV international week & XII science, technology and innovation week”. *Universidad Francisco de Paula Santander*, Cúcuta, Colombia, 2017.

TECHNICAL STRENGTHS

Programming	Python, MATLAB, C++, C, R, Java, VHDL
Web languages	HTML, CSS3, SQL, JavaScript, PHP
Platforms	Linux, Arduino, Raspberry
Frameworks	PyTorch, Tensorflow, NodeJS, PyG (PyTorch Geometric)
Software	Android Studio, MATLAB, Microsoft Office, TexStudio, Proteus, Xilinx, LabView, Arduino IDE, OrCAD
Mathematical and theoretical skills	
Leadership and teamwork	

COURSEWORKS

Advanced machine learning, electronic designs, digital signal processing, probability and statistics, computer architecture, analog and digital communications systems, digital designs, microcontrollers, microelectronics, analog and digital control, statistical learning.