Daniel Andrés Triana Camacho
Street
Mobile:
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Profile

Daniel Andrés Triana Camacho has a B.S. degree in electronic engineering with an MSc. in physics and Ph.D.(c) in physics. He has been working for ten years as a professor at the university, teaching basic sciences and electronic subjects. Moreover, he has experience in experimental physics, cement-based composites, Python programming, Matlab, LaTex..., modeling and simulation, electrochemistry, and electronic design. He has excellent relationships with people and teamwork skills and is very responsible and committed to the activities entrusted to him. From 2011 to 2021, he has been a research member of the CIMBIOS group at Universidad Industrial de Santander. He has received awards and honors, including the Bicentennial Fellowship (Colombian Ministry of Science) (2020), the Sun Clock award for best cathedra teacher of the year (2017), Fifth national position in ICFES exams for undergraduate students (2010), and two best poster presentation in international conferences.

Education

2023–Ph.d.(c). in Physics, *Universidad Industrial de Santander, Bucaramanga/Colombia.*
2019–Msc. Physics, *Universidad Industrial de Santander, Bucaramanga/Colombia.*
2014–Electronic Engineer degree of the *Unidades Tecnológicas de Santander, Bucaramanga/Colombia*
2010–Electronic Technologist of the *Unidades Tecnológicas de Santander, Bucaramanga/Colombia*

Work Experience

University teaching:

- **October 2016 – Present.** Titular professor of the *Universidad Industrial de Santander* of subjects: Electronic for Physicists, Electronic instrumentation, Nanoscience and Nanotechnology, Material Science in Engineering, Electrodynamics, Laboratories of Physics I, Physics II, and Physics III.
- **January 2016 – November 2021.** Assistant professor of the *Universidad Autónoma de Bucaramanga* of subjects: Python programming, Mechanics, Electromagnetism, Waves-Particles, and their Laboratories.
- **August 2011 – June 2017.** Assistant professor of the *Unidades Tecnológicas de Santander* of subjects: Modern Physics, Differential Equations, Electromagnetism, Mechanics, Engineer's Physics, Physics Laboratory, Trigonometry with analytical geometry.

Research and administrative experience in the public education sector:

- **September 2022 - 2023.** Researcher in materials characterization of cement/based carbon and gold nanocomposites and design of an electronic device to monitor the piezo properties of such based-carbon nanomaterials, project id 3711 at the Universidad Industrial de Santander (UIS) and the Colombian Ministry of Science.
- **July 2021.** Researcher in materials characterization of gold nanoparticles means XPS and surface techniques for the "capital semilla" grand number 2676.
- **September, July 2020; May 2023.** Researcher in materials production and characterization of cement-based composites of the "semillero de nanociencias" grand numbers 2594 and 2594.
- **September 2014 – December 2015.** Professional of the Center for Scientific and Technological Research in Materials and Nanoscience CMN.
- **February 2011 – June 2014.** Advisor in information systems responsible for administering administrative and academic software, preventive and corrective maintenance of computer equipment, impact printers, inkjet, and laserjet.
- **July 2010 – September 2010.** Technologist of production of electronic cards for medical equipment of invasive and non-invasive monitoring.

Teaching Training

- Researcher Academy On Campus ELSEVIER, March-April 2023.
- Mediating the teaching-learning process, 64 hours, June 2021.
- Teacher training for ICT-Supported teaching; 60 hours, June 2020.
- Seminar reading and writing in Spanish applied to the teaching, 120 Hours, July 2018.
- School of teaching, 30 hours, October 2016.
- Workshop in writing for scientific articles, 20 hours, May 2015.
- Seminar in teaching planning, 56 hours, August 2014
- Seminar in prospective planning, 120 hours, November 2011.

Presentations at scientific events

- *XI Congreso Internacional de Materiales XI CIM 2022 certificate of presentation, October 2022.*

- *14th International Workshop on Impedance Spectroscopy (IWIS)" with the work entitled Gold nanoparticles embedded in cement paste, a change in the polarization resistance by impedance spectroscopy, which took place from September until October 1st, 2021.*
- *5th International Conference on Materials Sciences and Nanomaterials (ICMSN 2021), London July 2021.*
- *Tercer congreso internacional de pedagogía, Colombia, May 2021.*
- *Clute International Academic Conference on Education - Science Track (ISEC), August 2019.*
- *5th IMRMPT conference, New York, May 2019.*
- *1st Applied Phys. Eng. & Innovation, Colombia October 2018.*
- *1st International Congress on Virtual Education. Challenges and Opportunities, Colombia October 2018.*
- *3rd International Conference on Theoretical and Condensed Matter Physics, New York October 2017.*
- *2do biomedical engineering update seminar, November 2016.*
- *VII Latin American Congress of Biomedical Engineering, October 2016.*
- *5 IEEE Colombian workshop on circuits and systems, Bogotá October 2014.*
- *XXIV Congreso Nacional de Física, Bogotá, October 2011.*

Research experience

- Nowadays, I work on "Piezoelectricity of cement mixed with nanocomposites," from experimental construction to a theoretical study of the subject. I have advanced the following: Developing sustained concrete structures for low energy demand can be achieved by improving their piezoelectric properties by including metallic nanoparticles or carbonous nanocomposites such as reduced graphene oxide, carbon nanotubes, cooper nanoparticles, and graphite nanoparticles on the cement paste. This work obtained nanocomposites by mean pulse laser ablation in liquid (PLAL) and by ultrasonic dispersing methods. Their size morphology was measured through dynamic light scattering (DLS), Atomic force microscopy (AFM), and scanning electronic microscopy (SEM), including energy dispersive X-ray spectroscopy (EDS). Electrical characterization was performed through impedance spectroscopy, cyclic voltammetry, and open circuit potential measurements. Finally, the mechanical properties of the specimens were measured by compressive test in combination with previous electric measurements. The main findings of this research can be found in references [1] and [2].
- The Master in Physics graduate investigation entitled, "Time-based electrochemical method alternative to capacitance spectroscopy, to study the density of states of a redox system." We started to study capacitance spectroscopy to develop our method from current transients. The redox process of FeIII/FeII was used as a model for comparing the two methods. Due to a large amount of experimental data and in order to obtain the capacitance for different potentials from capacitance spectroscopy and current transients, A Python script was developed. Comparing the results obtained from both methods, I found that the capacitance versus potential measurements can be obtained at short integration times, and I proposed the validation method. It was performed using an R.C. circuit with known resistance and capacitance values.
- The undergraduate project entitled "Optical characterization, in near-infrared, of breast tissue for early cancer detection." In this research, we fabricated a breast phantom and mixed some materials of low cost and environment-friendly as pectin and collagen. We studied their mechanical and optical properties too. An optoelectronic device was developed to measure the absorbance of three wavelengths: 735, 805, and 850 nm. This research aimed to design, fabricate, and calibrate the optoelectronic device, make mechanical characterization, and write two papers.
- I have worked on other research related to electrodynamics as learning methods and induction heating.

Publications

[1] Daniel A. Triana-Camacho, Jorge H. Quintero-Orozco, Enrique Mejía-Ospino, Germán Castillo-López, Enrique García-Macías, Piezoelectric composite cements: Towards the development of self-powered and self-diagnostic materials, Cement and Concrete Composites, Volume 139, 2023, 105063, ISSN 0958-9465, https://doi.org/10.1016/j.cemconcomp.2023.105063.

[2] Daniel A. Triana-Camacho, David A. Miranda, Enrique García-Macías, Oscar A. Mendoza Reales, Jorge H. Quintero-Orozco, Effective medium electrical response model of carbon nanotubes cement-based composites, Construction and Building Materials, Volume 344, 2022, 128293, ISSN 0950-0618, https://doi.org/10.1016/j.conbuildmat.2022.128293.

[3] Triana-Camacho, D. A., Quintero-Orozco, J. H., & Perez-Taborda, J. A. (2021). Cement-Based Piezoelectricity Applic|ation: A Theoretical Approach. In Cement Industry-Optimization, Characterization and Sustainable Application. IntechOpen.

[4] Pedrozo, D., Barajas, F., Estupinán, A., Cristiano, K. L., & Triana, D. A. (2020, March). Data analysis for a set of university student lists using the k-Nearest Neighbors machine learning method. In Journal of Physics: Conference Series (Vol. 1514, No. 1, p. 012011). IOP Publishing.
[5] Pedrozo, D., Barajas, F., Estupinán, A., Cristiano, K. L., & Triana, D. A. (2020, March). Development and implementation of a predictive method for the stock market analysis, using the long short-term memory machine learning method. In Journal of Physics: Conference Series (Vol. 1514, No. 1, p. 012009). IOP Publishing.
[6] Acevedo, J. C., Trejos, J. G., Celis, D. M., Herrera, J. R., Cristiano, K. L., & Triana, D. A. (2019, November). Virtual laboratory for measuring of elastic modulus with stress and strain for different metals. In Journal of Physics: Conference Series (Vol. 1386, No. 1, p. 012143). IOP Publishing.
[7] Angelone, J. P., González, N., Adarme, J., Rueda, S., Cristiano, K. L., Herrera, J. R., & Triana, D. A. (2019, November). Software to determine the viscosity and honey's purity using a ball viscometer. In Journal of Physics: Conference Series (Vol. 1386, No. 1, p. 012120). IOP Publishing.
[8] Cristiano, K. L., Triana, D. A., Ortíz, R., Pico, M., & Estupinán, A. F. (2019, November). Analytical and experimental determination of gravity and moment of inertia using a physical pendulum. In Journal of Physics: Conference Series (Vol. 1386, No. 1, p. 012139). IOP Publishing.
[9] Cristiano, K. L., Triana, D. A., Ortiz, R., & Estupiñán López, A. F. (2019). Experimental methods for the study of standing waves in strings. Available at SSRN 3847531.
[10] Cristiano, K. L., Estupiñán, A., & Triana, D. A. (2019, June). Python script used as a simulator for the teaching of the electric field in electromagnetism course. In Journal of Physics: Conference Series (Vol. 1247, No. 1, p. 012044). IOP Publishing.
[11] Cristiano, K. L., & Triana, D. A. (2019). Google classroom as a tool-mediated for learning. In Journal of Physics: Conference Series (Vol. 1161, No. 1, p. 012020). IOP Publishing.
[12] Triana, D. A., Cristiano, K. L., Gutiérrez, J. C., & Miranda, D. A. (2017). Mechanical Characterization of a Breast Phantom. In VII Latin American Congress on Biomedical Engineering CLAIB 2016, Bucaramanga, Santander, Colombia, October 26th-28th, 2016 (pp. 489-491). Springer, Singapore.
[13] Miranda, D. A., Cristiano, R. K. L., & Triana, D. A. (2014, October). Design, assembly and calibration of an optoelectronic device that measures three wavelengths in the near-infrared for breast cancer early detection. In 2014 IEEE 5th Colombian Workshop on Circuits and Systems (CWCAS) (pp. 1-4). IEEE.

Awards

- Award at UIS “premio para el reconocimiento de experiencias con tic en procesos formativos durante la contingencia covid-19 coopera-tic 2020”, Colombia November 2020.
- Award for best poster presentation at the 5th IMRMPT conference in San Jose de Cucuta, May 2019.
- Award at UIS “Reconocimiento por presentar material de apoyo, con incorporación TIC para los laboratorios de física básica”, Colombia November 2017.
- Award for best poster presentation at the 3rd International Conference on Theoretical and Condensed Matter Physics, New York October 2017.
- Nomination for the Solar Clock award, best cathedra professor of the *Universidad Autónoma de Bucaramanga*, July 2017.
- Award for academic achievements of the Departmental Government and the Secretary of Education for results in the ECAES test, September 2008.

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