Dariush Ebrahimibagha

ORCID: 0000-0003-1280-3452 Curriculum Vitae, March 2025
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Summary: Highly innovative researcher with a Ph.D. in Nanotechnology, combining expertise in polymer chemistry and materials science with advanced skills in machine learning, microcontroller systems, and sensor integration. Experienced in modeling and optimizing composite materials, as well as the synthesis of nanomaterial and conductive polymers. Strong background in experimental techniques and data analysis, coupled with a deep understanding of the physico-chemical as well as mechanical properties of materials. Seeking a challenging postdoctoral position to advance cutting-edge research in materials science, utilizing my unique skillset.

EDUCATION

Ph.D. in Nanotechnology 02/2021- 12/2024
Instituto Tecnológico y de Estudios Superiores de Monterrey, Monterrey, México
Thesis Title: Design and Development of Conducting Polymer and Carbon Nanostructure based Efficient Thermoelectric Materials

- Synthesis different morphology of Polyaniline (0D, 1D and 2D)
- Developed machine learning models such as correlation matrix, linear regression, polynomial regression, principal component analysis, and artificial neural network for predicting and optimizing the thermoelectric performance of PANI-CNT nanocomposites.
- Utilized genetic algorithm for optimization of high-performance thermoelectric nanocomposite.
- Synthesis conductive polymer and its CNT-based nanocomposite.

Master of Science in Polymer Science and Technology 09/2011 – 01/2014
Iran Polymer and Petrochemical Institute (IPPI), Tehran, Iran
Thesis Title: Synthesis of Nanocrystalline cellulose particles and study of nanoparticle addition on mechanical properties of self-healing water-based acrylic coating containing ethyl-cellulose microcapsules.

Bachelor of Science in Pure Chemistry 09/2007 – 07/2011
Damghan University, Damghan, Iran
Research projects:

- Introducing the new substrate (inorganic-polymeric based on calcium carbonate) in water magnetic treatment
- Prepare nickel Nanoparticles by electroplating method

EMPLOYMENT HISTORY

Instituto Tecnológico y de Estudios Superiores de Monterrey| Researcher | 12/2024 – Present

- Collaborate with Microfabrication research group to develop bio-printing hydrogel fibers by chaotic bioprinting method.

Iran Polymer and Petrochemical Institute | Researcher | 07/2017 – 12/2020
Collaborate with Department **Tissue Engineering and Regenerative Medicine Institute in Azad University, Iran**

- Investigated the synthesis of Poly (Glycerol Sebacate) and used biopolymers in Tissue Engineering
- Used 3D-Printing in the biomaterial field
- Electrospinning of Nanofibers

Iran Polymer and Petrochemical Institute | Researcher | 05/2016 – 06/2017
Collaborate with Department of Color, Resin & Surface Coatings and 3D-Printing, **Iran Polymer and Petrochemical Institute, Tehran, Iran**.

- Investigated the use of bio raw material (polylactic acid) in 3D-Printing.
- Focused on 3D-Printing methods such as stereolithography (SLA) and Fused Deposition Modelling (FDM).

Iran Polymer and Petrochemical Institute | Site Supervisor – Traffic Paint Application | 06/2014 – 05/2016
Collaborate with Department of Color, Resin & Surface Coatings, **Iran Polymer and Petrochemical Institute, Tehran, Iran.**

- Supervisor of Tehran Line Road Line Project.
- Studied the following topics after implanting the road line: nozzle temperature, color yellowing index, adhesion to metal surface, distribution of color glass beads, and measuring its light reflection index.

SKILLS

Instrumentation: Electrospinning, AFM, Optical Microscopy, Tensile Testing, FT-IR, UV-Vis, Light Scattering, Freeze Drying, Turbidimetry, Conductometry, Oscilloscope, XRD, SEM, Microcontroller Programming (Arduino IDEa and ESP32), Sensor Integration.
Software: Python, MATLAB, Mendeley, Arduino IDE, Microsoft Office Suite, Machine Learning libraries.
Language Skills: English Advanced, Farsi Native, Spanish Basic

PRESENTATIONS

- Machine learning to evaluate the effect structural and compositional structure of thermoelectric performance in poly (3,4-Ethylene dioxythiophene) and carbon-based composite. 3rd International Conference on Recent and Advanced Composite Materials (ICRACM-2025) SRM Institute of Science and Technology, India,2025.
- An Insight into Polyaniline/Carbon Nanotube Thermoelectric Nanocomposite by Genetic Algorithm, 5th International Conference on Advances in Mechanical Engineering. SRM Institute of Science and Technology, India,2024.
- Emulsion Electrospun Fiber Mats of PCL and Scrophularia Striata for Wound Dressing Applications,14th International Seminar on Polymer Science and Technology Tehran, Iran, 2020.
- Investigation of reaction time on molecular weight and curing process of poly (glycerol sebacate), 6th International Conference and Exhibition on Advanced and Nano Material, Canada, 2018.
- Effects of micro and nano-sized $CaCO_3$ on mechanical properties of resin used for stereolithography, International Seminars on Polymer Science and Technology (ISPST), Poster presentation, Tehran, Iran, 2018.
- Investigation of tensile and dynamic mechanical properties and surface fracture of a water-based coating reinforced with Nanocrystalline cellulose, International Seminars on Polymer Science and Technology (ISPST), Oral Presentation (English), IPPI, Tehran, Iran, 2014.
- Mechanical properties of a water-based coating containing Nanocrystalline (NCC) cellulose and Nano fibral cellulose (NFC) fiber. 5th International Color And Coatings Congress (ICCC), Poster presentation Isfahan, Iran, 2013.
- Preparation of Nanocrystalline cellulose from cotton as a green filler, 5th International Color And Coatings Congress (ICCC), Oral Presentation, Isfahan, Iran, 2013.
- Introducing the new substrate in water magnetic treatment, 9th National Chemistry Conference. Poster Presentation, Iran, 2011.

Articles

- Morteza Behzadnasab, Ali Akbar Yousefi, **Dariush Ebrahimibagha**, Farahnaz Nasiri. (**2020**). Effects of processing conditions on mechanical properties of PLA printed parts. Rapid Prototyping Journal, 26(2), 381-389. https://doi.org/10.1108/RPJ-02-2019-0048. 2023, **IF= 3.4**.
- **Dariush Ebrahimibagha**, Mallar Ray, Shubhabrata Datta. "Informatics-based design of polyaniline-carbon nanotube thermoelectric nanocomposite using ANN and GA." Functional Composites and Structures 6, no. 4 (**2024**): 045008. doi :10.1088/2631-6331/ad8f28. 2023, **IF=3.1**.
- **Dariush Ebrahimiba**, Sergio Arroyo Armida, Mallar Ray, Shubhabrata Datta. "Machine learning based models to investigate the thermoelectric performance of carbon nanotube-polyaniline nanocomposites." Computational Materials Science 232 (**2024**): 112601. https://doi.org/10.1016/j.commatsci.2023.112601. 2023, **IF=3.1**.
- **Dariush Ebrahimibagha**, Mallar Ray, Shubhabrata Datta. An Insight into Polyaniline/Carbon Nanotube Thermoelectric Nanocomposite by Genetic Algorithm. published in Journal of Materials Engineering and Performance (**2025**). https://doi.org/10.1007/s11665-025-10873-8. 2023, **IF=2.2**.
- Sergio Arroyo Armida, **Dariush Ebrahimibagha*****, Mallar Ray, and Shubhabrata Datta. "Assessing thermoelectric performance of quasi 0D carbon and polyaniline nanocomposites using machine learning." Advanced Composite Materials 33, no. 3 (**2024**): 388-410. https://doi.org/10.1080/09243046.2023.2262875. 2023, **IF=2**.
- Pezeshki-Modaress, Mohamad, Mohadeseh Akbarzadeh, **Dariush Ebrahimibagha**, Mojgan Zandi, Tayyeb Ghadimi, Amin Sadeghi, and Sarah Rajabi. "Fabrication and In Vitro Evaluation of A Chondroitin Sulphate-Polycaprolactone Composite Nanofibrous Scaffold for Potential Use in Dermal Tissue Engineering." Cell Journal (Yakhteh) 24, no. 1 (**2022**): 36. doi: 10.22074/cellj.2022.7655.2023, **IF=1.7**.

***** Equal contribution as first author

Workshops Attended

- The theoretical and practical principle of adhesion course, Iran Polymer and Petrochemical Institute, Iran, 2012.
- Second fire retardant systems course, Iran Polymer and Petrochemical Institute, Iran, 2012
- 13th professional training course of composites: Iran Polymer and Petrochemical Institute, Iran, 2012.

REFERENCES ON REQUEST

Mallar Ray
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Campus Monterrey, School of Engineering and Sciences, Tecnológico de Monterrey
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