**Faculty Profile: Gregorio Toscano**

Assistant Professor

Department: Electrical Engineering and Computer Science

School: School of Engineering

Email: [gtoscano@cua.edu](mailto:gtoscano@cua.edu)

Phone: 202-319-4289

Education: Ph.D., Electrical Engineering (Computer Science), Cinvestav-IPN, 2005

**Research Interests and Expertise:**

Multi-objective Optimization. Application of cutting-edge algorithms to solve large-scale optimization problems. Integration of user preferences in multi-objective optimization for better decision support. Utilization of machine learning models in optimization scenarios, enhancing decision-making and “innovization” techniques.

**Biography:**

Gregorio Toscano is an Assistant Professor at The Catholic University of America, having joined in the fall of 2024. Prior to this, he was an Associate Professor at Cinvestav-IPN, Mexico, where he dedicated nearly two decades to research and academic excellence. Dr. Toscano also served as a Research Associate at Michigan State University, collaborating on multi-objective optimization for watershed management projects. He earned his Master's degree from the University of Veracruz and completed his Ph.D. at Cinvestav-IPN, where he later contributed as an influential faculty member.

Dr. Toscano has significantly impacted the field of evolutionary computing, developing the first multi-objective micro-genetic algorithm and pioneering multi-objective particle swarm optimization strategies. His scholarly work has resulted in over 8,000 citations, ranking him as the fourth-most-cited computer science researcher in Mexico as of 2015. He has published over 65 papers in peer-reviewed journals and international conferences, demonstrating a consistent focus on advancing computational science through innovative problem-solving and optimization techniques.

**Five Selected Papers:**

[1] Toscano, G., Razavi, H., Nejadhashemi, P., Deb, K., Linker, L. “Large-scale Multi-objective [2] Optimization for Watershed Planning and Assessment.” *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, 2024.

[2] Toscano, G., Hernández-Suárez, J., Blank, J., Nejadhashemi, P., Deb, K. “Utilizing Innovization to Solve Large-Scale Multi-Objective Chesapeake Bay Watershed Problem.” *IEEE Congress on Evolutionary Computation*, 2023.

[3] Toscano, G., et al. “Evolutionary Instance Selection Based on Preservation of the Data Probability Density Function.” *Computación y Sistemas*, 2022.

[4] Toscano, G., et al. “A New Gearbox Model for Processing Large Volumes of Data Using Virtual Containers.” *Future Generation Computer Systems*, 2020.

[5] Carlos A. Coello Coello, Gregorio Toscano Pulido, and Maximino Salazar Lechuga, “Handling Multiple Objectives With Particle Swarm Optimization,” IEEE Transactions on Evolutionary Computation 8, no. 3 (June 2004):256–279, issn: 1089-778X, <https://doi.org/10.1109/TEVC.2004.826067>

**Professional Activities (please also include STEM education/diversity/outreach activities)**

* **Managing Editor**, *IEEE Transactions on Evolutionary Computation* (2021-present).
* **Senior Member**, IEEE, ACM, and Mexican Academy of Computing.
* **Best Paper Awards** at CEC 2022, MCPR 2022, and EA 2009.
* **Fourth-most-cited Computer Science Researcher in Mexico**, 2015 (Scientometric mapping study).
* **Mentor** for Competitive Programming at CUA.