Mario Alejandro Hevia Fajardo

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Research Interests

- Evolutionary computation
    - Evolutionary algorithms
    - Competitive coevoluationary algorithms
    - Runtime analysis
- Blackbox optimisation
- Combinatorial optimisation

Education

2019–2022 **PhD Computer Science**, *University of Sheffield*, UK.
Title: *Runtime Analysis of Success-Based Parameter Control Mechanisms for Evolutionary Algorithms on Multimodal Problems*

2017–2018 **MSc Data Analytics**, *University of Sheffield*, UK, *1st* – Distinction.
Dissertation: *Comparison and modification of self-adjusting evolutionary algorithms*

2010–2014 **BSc Mechatronics Engineering**, *Tecnológico de Monterrey*, Mexico, Distinction.
CENEVAL award for the "EGEL–Excellence Performance"
Outstanding participation in the high performance academic group, Principia 2010–2012

Work Experience

2022–Present **Research Fellow**, *University of Birmingham*, UK.
Turing AI Acceleration fellowship project on coevolution.

2019–2021 **Graduate Teaching Assistant**, *University of Sheffield*, UK.

2016–2017 **Field Service Engineer**, *Festo Pneumatic*, Mexico.
Accountable for the commissioning of high complexity projects for key clients (Bimbo, Jumex, Femsa) and coordinator for the commissioning of low and medium complexity projects in the center and south of Mexico.
- Create a standard for programming of Festo PLC and HMI nationwide in accordance with IEC 61131-3.
- Key participation in the creation of procedures for the commissioning of projects that include programming nationwide.
- Improved response time of services in the center and south of Mexico.

2015–2016 **Project Engineer**, *Festo Pneumatic*, Mexico.
Accountable for the commissioning of low and medium complexity projects in Mexico City, Cuernavaca and Queretaro.

2013–2014 **Initiative Operation Leader**, *Procter & Gamble*, Mexico.
Coordinate local project delivery functions and the needed supply chain items to ensure that product changes from HDL (Heavy Duty Liquids) and HDW (Hand Dish Washers) categories produced in Vallejo Plant and Aerobal were delivered to the market as planned.

Awards and Achievements

2021 **Best paper award**, *ACM Genetic and Evolutionary Computation Conference (GECCO)*.
Award in the prestigious "Theory" track.

07-12/2014 **CENEVAL award for "EGEL–Excellence Performance"**.
Awarded by the National Evaluation Center for Higher Education (CENEVAL) to the graduates who reached the level of excellence ($\sim 1\%$ of graduates at national level) in their General Exam for the Graduate Degree (EGEL).

2012 **Third place in the 2° Tournament of Minisumo Robots "Bogotron"**.
University wide competition at Tecnológico de Monterrey.

2010 **First place in the Robotics Lego Contest**.
Held by the Alumni Society of Mechatronics of Tecnológico de Monterrey.

2010 **First place in the XII Mathematics Contest High School Category Federation Phase**.
Held by the Federation of Private Schools of the State of Mexico (FEPEM).

Grants

2019–2022 **Doctoral Scholarship from the Department of Computer Science**, *University of Sheffield*, UK.
Full UK/EU tuition fee and maintenance stipend for three years (approximately £60k).

2020–2023 **CONACYT Scholarship for Doctorate Studies Abroad 2020**, *CONACYT*, Mexico.
Largest doctorate scholarship offered by CONACYT at the time (approximately £47k).

2010–2014 **Scholarship for Undergraduate Studies**, *Tecnológico de Monterrey*, Mexico.

Teaching Experience

Autumn 20/21 **Tutorials: Advanced Algorithms**, *University of Sheffield*, UK.

Spring 20/21 **Teaching Assistant: Scalable Machine Learning**, *University of Sheffield*, UK.

Spring 19/20 **Tutorials: Introduction to Algorithms and Data Structures**, *University of Sheffield*, UK.

Spring 19/20 **Teaching Assistant: Scalable Machine Learning**, *University of Sheffield*, UK.

Spring 18/19 **Tutorials: Introduction to Algorithms and Data Structures**, *University of Sheffield*, UK.

2015–2017 **Instructor: Industrial training courses and seminars**, *Festo Pneumatic*, Mexico.
Programming PLC, electric drives/motors, 3-dimensional gantries, image processing and network communication.

Spring 2014	**Personal tutor**, *Tecnológico de Monterrey*, Mexico.
	Provide personal lessons to undergraduate students in mechanical, electrical and electronic engineering.

Professional activities

Organising Committees

UK AI Conference 2023

Reviewer for Journals

Information Sciences

Theoretical Computer Science

IEEE Transactions on Evolutionary Computation

Program Committee Memberships

Genetic and Evolutionary Computation Conference (GECCO) 2023

Additional Skills

Languages

Spanish	Native	English	Fluent

Programming Skills

Python	Very good knowledge	Ocaml	Good knowledge
Spark (Scala)	Good knowledge	C++	Good knowledge
LaTeX	Good knowledge	R	Good knowledge

Courses and Training

Mgmt.	"Fit for Leading Leaders"	*July 2017 at Festo Pneumatic*
Sales	"Fit for Change - Module II"	*October 2016 at Festo Pneumatic*
Sales	"Fit for Change - Module I"	*April 2016 at Festo Pneumatic*
Mgmt.	"Managing Talent"	*November 2015 at University of Michigan*
Mgmt.	"Inspiring and Motivating Individuals"	*October 2015 at University of Michigan*
Teach	"Training the trainers"	*March 2015 at Festo Didactic*

Publications

Journal Papers

[1] Mario Alejandro Hevia Fajardo and Dirk Sudholt. Theoretical and empirical analysis of parameter control mechanisms in the $(1 +(\lambda,\lambda))$ genetic algorithm. *ACM Trans. Evol. Learn. Optim.*, 2(4), January 2023. ISSN 2688-299X. doi: 10.1145/3564755. URL https://doi.org/10.1145/3564755.

Conference Papers (peer reviewed)

[2] Mario Alejandro Hevia Fajardo and Dirk Sudholt. Hard problems are easier for success-based parameter control. In *Proceedings of the Genetic and Evolutionary Computation Conference*, GECCO '22, page 796–804, New York, NY, USA, 2022. Association for Computing Machinery. ISBN 9781450392372. doi: 10.1145/3512290.3528781. URL `https://doi.org/10.1145/3512290.3528781`.

[3] Mario Alejandro Hevia Fajardo and Dirk Sudholt. Self-adjusting offspring population sizes outperform fixed parameters on the cliff function. In *Proceedings of the 16th ACM/SIGEVO Conference on Foundations of Genetic Algorithms*, FOGA '21. ACM, 2021b.
Nominated to **Best paper award**

[4] Mario Alejandro Hevia Fajardo and Dirk Sudholt. Self-adjusting population sizes for non-elitist Evolutionary Algorithms. In *Proceedings of the Genetic and Evolutionary Computation*, GECCO '21, page 1151–1159. ACM, 2021a. Full version available at `http://arxiv.org/abs/2104.05624`.
Best paper award in the track "Theory". Invited to a special issue in *Algorithmica*.

[5] Mario Alejandro Hevia Fajardo and Dirk Sudholt. On the choice of the parameter control mechanism in the $(1 + (\lambda, \lambda))$ genetic algorithm. In *Proceedings of the Genetic and Evolutionary Computation Conference*, GECCO' 20, page 832–840. ACM, 2020.

[6] Mario Alejandro Hevia Fajardo. An empirical evaluation of success-based parameter control mechanisms for evolutionary algorithms. In *Proc. Genetic and Evolutionary Computation Conference*, GECCO' 19, pages 787–795. ACM, 2019.