José Miguel Aragón Jurado

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I am a PhD student under the Spanish National FPU Fellowship. I hold a Bachelor of Science in Computer Engineering and a Master of Research in Systems and Computing Engineering, both from the University of Cádiz, where I received the Extraordinary Master's Degree Award for Best Academic Record. I am a member of the GOAL research group [TIC-259] at the University of Cádiz, as well as a member of the IEEE society.

My PhD research focuses on Green Software, with an expected completion date of November 2025. It is built on three main pillars: (1) Automatic optimization of software to generate higher performance and/or greener versions, (2) Green Software for the Internet of Things, and (3) Green video games. Currently, I am developing the third pillar, concentrating my research on improving the energy consumption and performance of video games by applying AI-based algorithms.

I hold a total of six publications in high-impact research journals indexed in the JCR: three in Q1 and three in Q2. In 2023, I received the Cepsa Foundation Chair Award for the article titled *"Optimal Battery Management Strategies for Plug-in Electric Hybrid Buses on Routes Including Green Corridor."* These publications cover topics such as software optimization, code obfuscation, optimization of public transport emissions, deep learning models, and the application of artificial intelligence in video games.

Additionally, I have contributed to six international conferences, receiving the Best Paper Award at the 32nd INGEGRAF International Conference held in Cádiz, Spain, for the paper titled *"Multivariable Visualization Tool of the Performance of Plug-In Hybrid Electric Buses."* On the national level, I have presented six articles, winning the Best Paper Award at the III Spanish Video Game Congress held in A Coruña, Spain, for the work titled *"Optimización automática del videojuego Doom para un rendimiento óptimo en Steam Deck."*

WORK EXPERIENCE

PREDOCTORAL RESEARCHER (FPU FELLOW) **Cádiz, Spain**
University of Cádiz *January 2023–Present*
Expected PhD Completion: November 2025

- PhD Thesis on Automatic Software Optimization for a Sustainable Internet of Things.
- Development of multiple complex Metaheuristic techniques, especially Genetic Algorithms, for solving optimization problems in Python.
- Extensive knowledge of LLVM infrastructure for C, C++, Objective C and Swift applications.
- Published research papers in high-impact journals and international conferences on different topics, including software optimization, code obfuscation, and artificial intelligence.

GRADUATE RESEARCHER **Cádiz, Spain**
University of Cádiz *November 2021–September 2022*

- Analyzed energy consumption data for plug-in hybrid buses and developed predictive regression models.

- Conducted data processing, enrichment, and imputation, including treatment of data uncertainty.
- Optimized operational strategies and validated simulators and predictive tools developed during the project.

EDUCATION

UNIVERSITY OF CÁDIZ **Cádiz, Spain**
PhD in Computer Science *November 2022–Present*
Expected Completion: November 2025

UNIVERSITY OF CÁDIZ **Cádiz, Spain**
Master of Research in Systems and Computer Engineering *October 2021–September 2022*
Specialization in Big Data
Grade: 9.26/10

- Master's thesis awarded with Honors (Grade: 10/10)
- Achieved five Honors distinctions in various courses.
- Received the Extraordinary Master's Degree Award (Best Academic Record)

UNIVERSITY OF CÁDIZ **Cádiz, Spain**
Bachelor of Science in Computer Engineering *September 2017–July 2021*
Specialization in Computer Science
Grade: 8.73/10

- Bachelor's thesis awarded with Honors (Grade: 10/10)
- Achieved eight Honors distinctions in various courses.
- Student Research Assistant. *November 2018 – September 2020*

PUBLICATIONS

JOURNAL PAPERS

J6. Aragón-Jurado J. M.; de la Torre J. C.; Ruiz P.; Dorronsoro B. 2025. Automatic software tailoring for Green Internet of Things. Internet of Things. Elsevier. 30. 101521. DOI: 10.1016/j.iot.2025.101521

J5. Aragón-Jurado J. M.; de la Torre J. C.; Ruiz P.; Galindo P. L; Zomaya A. Y.; Dorronsoro B.2024. Automatic Software Tailoring for Optimal Performance. IEEE Transactions on Sustainable Computing. IEEE. 9-3, pp.464-481. DOI: 10.1109/TSUSC.2023.3330671

J4. de la Torre J. C.; **Aragón-Jurado J. M**.; Crespo-Álvarez A.; Bárcena-González G.2024. GAGI: Game engine for Artificial General Intelligence experimentation. SoftwareX. Elsevier. 26. DOI: 10.1016/J.SOFTX.2024.101665

J3. de la Torre J. C.; Jareño J.; **Aragón-Jurado J. M.**; Varrette S.; Dorronsoro B.2024. Source code obfuscation with genetic algorithms using LLVM code optimizations. Logic Journal of the IGPL. Oxford University Press. DOI: 10.1093/jigpal/jzae069

J2. Aragón-Jurado J. M.; de la Torre J. C.; Jareño J.; Dorronsoro B.; Zomaya A. Y.; Ruiz P.2023. Neuroevolved bi-directional LSTM applied to zero emission zones management in urban transport. Applied Soft Computing. Elsevier. 148. DOI: 10.1016/J.ASOC.2023.110943

J1. Ruiz P.; **Aragón-Jurado J. M.**; Seredynski M.; Cabrera J. F.; Peña D.; de la Torre J. C.; Zomaya A. Y.; Dorronsoro B.2023. Optimal battery management strategies for plug-in electric hybrid buses on routes including green corridors. Sustainable Cities and Society. Elsevier. DOI: 94.10.1016/J.SCS.2023.104556

BOOK CHAPTERS

B1. Dorronsoro B.; **Aragón-Jurado J. M.**; Jareño J.; de la Torre J. C.; Ruiz P. 2024. A Survey on Automatic Source Code Transformation for Green Software Generation. Encyclopedia of Sustainable Technologies (Second Edition). Elsevier. 3, pp.765-779. DOI: 10.1016/B978-0-323-90386-8.00122-4

INTERNATIONAL CONFERENCE PAPERS

C6. Aragón-Jurado J. M.; Jareño J.; de la Torre J. C.; Ruiz P.; Dorronsoro B. Two-level Software Obfuscation with Cooperative Co-evolutionary Algorithms. In 2024 IEEE Congress on Evolutionary Computation (CEC) (pp. 1-8). IEEE. 2024. Yokohama, Japan. DOI: 10.1109/CEC60901.2024.10612116

C5. Aragón-Jurado J. M.; Dorronsoro B.; Ruiz P.. Bus Route Segmentation for Performance Optimization Using Geographical Mapping Tools. International - Research and Innovation in Graphic Engineering: Tools for Achieving Sustainable Development Goals and Addressing Emerging Global Challenges. INGEGRAF. 2024. Valencia, Spain.

C4. Aragón-Jurado J. M.; Díaz-Jiménez M.; Dorronsoro B.; Pavón-Domínguez P.; Seredynski M.; Ruiz P.. Electric Drive Assignment Strategies Optimization for Plugin Hybrid Urban Buses on Tailored Emissions Mapping. In 2024 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW) (pp. 909-918). IEEE. 2024. San Francisco, USA. DOI: 10.1109/IPDPSW63119.2024.00160

C3. Aragón Jurado J. M.; Dorronsoro B.; Ruiz P.. Multivariable Visualization Tool of the Performance of Plug-In Hybrid Electric Buses. Advances in Design Engineering IV. INGEGRAF 2023. Lecture Notes in Mechanical Engineering. Springer, Cham. Cádiz, Spain. DOI: 10.1007/978-3-031-51623-8_30

C2. de la Torre J. C.; **Aragón-Jurado J. M.**; Jareño J.; Varrette S.; Dorronsoro B.. Obfuscating LLVM Intermediate Representation Source Code with NSGA-II. International Joint Conference 15th International Conference on Computational Intelligence in Security for Information Systems (CISIS 2022) 13th International Conference on EUropean Transnational Education (ICEUTE 2022). Lecture Notes in Networks and Systems, vol 532. Springer, Cham. Salamanca, Spain. DOI: 10.1007/978-3-031-18409-3_18

C1. Aragón-Jurado J. M.; de la Torre J. C.; Talbi E. G.; Dorronsoro B.. A Study on the Influence of Runtime Uncertainty in the Optimization of Software Programs. 8th International Conference on Metaheuristics and Nature Inspired Computing META. Marrakech, Morocco. 2021

NATIONAL CONFERENCE PAPERS

NC6. Aragón-Jurado J. M.; Jareño J.; de la Torre J. C.; Ruiz P.; Dorronsoro B.. Ofuscación de Software en dos Niveles usando Algoritmos Cooperativos Coevolutivos. XV Congreso Español de Metaheurísticas, Algoritmos Evolutivos y Bioinspirados. AEPIA. 2024. A Coruña, Spain.

NC5. Aragón-Jurado J. M.; de la Torre J. C.; Ruiz P.; Dorronsoro B.. Optimización automática del videojuego Doom para un rendimiento óptimo en Steam Deck. III Congreso Español de Videojuegos. Sociedad Científica Informática de España. 2024. A Coruña, Spain.

NC4. Aragón-Jurado J. M.; Acuña-Vega L. E.; Ortiz G.; Boubeta-Puig J.; Muñoz A.. Detección Inteligente de Sucesos en Smart Cities con Feedback de los Ciudadanos. XVII Jornadas de Ingeniería de Ciencia e Ingeniería de Servicios (JCIS 2022). SISTEDES. 2022. Santiago de Compostela, Spain.

NC3. Aragón-Jurado J. M.; de la Torre J. C.; Benito-Jareño C.; Dorronsoro B.. Optimización de programas software considerando la incertidumbre del tiempo de ejecución. XXVI Jornadas de Ingeniería del Software y Bases de Datos (JISBD 2022). SISTEDES. 2022. Santiago de Compostela, Spain.

NC2. Aragón-Jurado J. M.; Acuña-Vega L. E.; Ortiz G.; Boubeta-Puig J.; Muñoz A.. Hacia la Detección Inteligente de Sucesos en Ciudades Inteligentes con la Participación Ciudadana. II Jornadas de Investigación Predoctoral en Ingeniería Informática (JIPII 2022). University of Cádiz. 2022. Cádiz, Spain.

NC1. Aragón-Jurado J. M.; de la Torre J. C.; Benito-Jareño C.; Dorronsoro B.. Optimización robusta del tiempo de ejecución de programas software con Algoritmos Genéticos. II Jornadas de Investigación Predoctoral en Ingeniería Informática (JIPII 2022). University of Cádiz. 2022. Cádiz, Spain.

TEACHING EXPERIENCE

TEACHING ASSISTANT

Total hours delivered: 92

T3. Course/Subject: 2023-24 PERCEPTION. **Department/Center:** Department of Computer Engineering, University of Cádiz. **Hours delivered:** 24

T2. Course/Subject: 2023-24 MACHINE LEARNING. **Department/Center:** Department of Computer Engineering, University of Cádiz. **Hours delivered:** 36

T1. Course/Subject: 2022-23 AUTOMATA THEORY AND FORMAL LANGUAGES. **Department/Center:** Department of Computer Engineering, University of Cádiz. **Hours delivered:** 32

PRESENTATIONS AND LECTURES

INVITED LECTURES

L5. Source Code Obfuscation with Evolutionary Algorithms. Amii Artificial Intelligence Seminar. University of Alberta, Edmonton, Canada. 2024-07-29

ACADEMIC LECTURES

L4. Multi-objective optimization for the obfuscation of Software programs using LLVM. Master of Science in Cybersecurity. University of Cádiz, Cádiz, Spain. 2022-05-06

L3. Reducción del consumo energético de programas en teléfonos móviles con Android utilizando algoritmos genéticos. Bachelor of Science in Computer Engineering. University of Cádiz, Cádiz, Spain. 2021-09-29

L2. Algoritmos genéticos paralelos para la optimización de software: un análisis del rendimiento en diferentes plataformas. Bachelor of Science in Computer Engineering. University of Cádiz, Cádiz, Spain. 2021-09-29

L1. Algoritmos genéticos paralelos: diseños y aplicaciones. Bachelor of Science in Computer Engineering. University of Cádiz, Cádiz, Spain. 2021-09-29

OVERSEAS RESEARCH EXPERIENCE

RS1. Research Visitor at the University of Alberta, Edmonton, Canada. *May 2024 – August 2024*

Project Objective: Empirical study on the impact of compiler optimizations on the energy consumption of applications on iOS devices.

INVOLVEMENT IN FUNDED RESEARCH PROJECTS

P4. Soluciones inteligentes de conducción ecológica para la movilidad sostenible [PID2022-137858OB-I00]. National Project. Funding Entity: Ministerio de Ciencia e Innovación. Spain. **Work Team Member**

P3. Caracterización de la eficiencia energética en el binomio software/hardware mediante análisis multifractal [TED2021-131880B-I00]. National Project. Funding Entity: Ministerio de Ciencia e Innovación. Spain. **Work Team Member**

P2. Intelligent Generation of Sustainable Software - GENIUS [P18-FR-2399]. National Project. Funding Entity: Consejería de Economía, Innovación y Ciencia de la Junta de Andalucía. Spain. **Work Team Member**

P1. Sistemas Inteligentes de Transporte Urbano Sostenible [RTI2018-100754-B-I00]. National Project. Ministerio de Ciencia, Innovación y Universidades. Spain. **Work Team Member**

AWARDS AND GRANTS

PAPER AND PRESENTATION AWARDS

BP3. 2024 Best Paper Award - III Congreso Español de Videojuegos. Sociedad Científica Informática de España.

BP2. 2023 Best Journal Paper Award - Cepsa Foundation Chair Award. Cepsa.

BP1. 2023 Best Paper Award - International Conference on The Digital Transformation in Graphic Engineering 2023 (INGEGRAF 2023). INGEGRAF.

FELLOWSHIPS

F1. 2021 National FPU Fellowship. Ministerio de Universidades, Spain.

OTHER AWARDS

OA2. 2022 Extraordinary Master's Degree Award (Best Academic Record) in Master of Research in Systems and Computer Engineering.

OA1. 2019 First Prize Ideas - atrÉBT! (Edition XIII). University of Cádiz**.**

SERVICE

CONFERENCE ORGANIZATION

O2. Collaborator in International Conference on The Digital Transformation in Graphic Engineering 2023 (INGEGRAF 2023).

O1. 2023 Special Session Organization - Artificial Intelligence for Sustainability in the 6th International Conference on Optimization and Learning (OLA).

REVIEWER

R1. External reviewer for the book: Data Analytics and Computational Intelligence (2022)

PROFESSIONAL MEMBERSHIP

- **IEEE Society Member**
  March 2024 - Present