José Miguel Aragón Jurado

PhD Candidate in Computer Science | National FPU Fellow
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Languages: Spanish (native), English (C1+ equivalent), Japanese (basic familiarity)

PhD Candidate in Computer Science and National FPU Fellow at the University of Cadiz, Spain. My research focuses on green software optimization, artificial intelligence, and sustainable computing, with applications in video games and IoT systems. I have published in leading Q1/Q2 journals and presented at CORE A/A conferences. My work has been strengthened by international research stays in Canada (University of Alberta) and Japan (Ritsumeikan University).*

WORK EXPERIENCE

PREDOCTORAL RESEARCHER (FPU FELLOW) — **Cadiz, Spain**
University of Cadiz — *January 2023–Present*

- Conducting a PhD thesis titled *"Software Optimization for Green Internet of Things"*.
- Developed and benchmarked multi-objective metaheuristics (Genetic Algorithms, Cooperative Co-evolution, NSGA-II) to reduce energy consumption and execution time.
- Applied LLVM compiler infrastructure for source code transformation and optimization in C, C++, Objective-C, and Swift.
- Designed green-aware optimization pipelines for video game engines and mobile applications, validated through empirical experiments on real-world systems (iOS and Steam Deck).
- Authored and co-authored 6 peer-reviewed journal papers (Q1/Q2) and over 10 international conference papers (including CORE A/A*); additionally, 5 journal articles currently under review at high-impact venues (IEEE, Elsevier).
- Conducted collaborative research during two international research stays (Canada and Japan), leading to co-authored papers under review at top-tier venues (IEEE, Elsevier).

GRADUATE RESEARCHER — **Cadiz, Spain**
University of Cadiz — *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 CADIZ — **Cadiz, Spain**
PhD in Computer Science — *November 2022–Present*
Expected Completion: July 2025

UNIVERSITY OF CADIZ — **Cadiz, Spain**
Master of Research in Systems and Computer Engineering — *October 2021–September 2022*
Specialization in Big Data
GPA: 9.26/10

- *Master's thesis awarded 10/10 (with distinction)*
- Awarded the Extraordinary Master's Degree Award for best academic performance.
- Received five distinctions for academic excellence.

UNIVERSITY OF CADIZ **Cadiz, Spain**
Bachelor of Science in Computer Engineering *September 2017–July 2021*
Specialization in Computer Science
GPA: 8.73/10

- Bachelor's thesis graded 10/10 (with distinction)
- Received eight academic honors.
- 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: https://doi.org/10.1016/j.iot.2025.101521 (**IF 6.0, CiteScore 12.1, JCR Q1**, 2025).

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: https://doi.org/10.1109/TSUSC.2023.3330671 (**IF 3, CiteScore 7.7, JCR Q2**, 2025).

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: https://doi.org/10.1016/j.softx.2024.101665 (**IF 2.4, CiteScore 5.5, JCR Q2**, 2025).

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: https://doi.org/10.1093/jigpal/jzae069 (**IF 0.6, CiteScore 2.6, JCR Q2**, 2025).

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: https://doi.org/10.1016/j.asoc.2023.110943 (**IF 7.2, CiteScore 15.8, JCR Q1**, 2025).

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: https://doi.org/10.1016/j.scs.2023.104556 (**IF 10.5, CiteScore 22.0, JCR Q1**, 2025).

JOURNAL PAPERS UNDER REVIEW

J11. Aragón-Jurado J. M.; de la Torre J. C.; Ruiz P; Dorronsoro B. 2025. *Two-level Automatic Software Tailoring for Optimal Performance*. Under review in Applied Soft Computing. Elsevier. (**IF 7.2, CiteScore 15.8, JCR Q1**, 2025).

J10. Aragón-Jurado J. M.; Dorronsoro B.; Ruiz P. 2025. *Evaluating Compiler Optimizations for Faster and Greener Web Browsing*. Under review in Sustainable Computing: Informatics and Systems. Elsevier. (**IF 3.8, CiteScore 10.7, Q1**, 2025).

J9. Díaz-Jiménez M**.; Aragón-Jurado J. M.;** Dorronsoro B.; Pavón-Domínguez P.; Seredynski M.; Ruiz P. 2025. *Optimization of Urban Public Transport System Sustainability using Plugin Hybrid Buses for Tailored Emissions Mapping*. Under review in Engineering Applications of Artificial Intelligence. Elsevier. (**IF 7.5, CiteScore 9.6, Q1**, 2025).

J8. Aragón-Jurado J. M.; Ruiz P.; Thawonmas R.; Dorronsoro B. 2025. *Green Gaming: Automated Energy Consumption Reduction for Doom Engine*. Under review in IEEE Consumer Electronics Magazine. IEEE. (**Outcome of research stay in Ritsumeikan University**) (**IF 3.7, CiteScore 10, Q2**, 2025).

J7. Aragón-Jurado J. M.; Bangash A. A.; Dorronsoro B.; Ali K.; Hindle A.; Ruiz P. 2025. *Does Faster Mean Greener? Runtime and Energy Trade-offs in iOS Applications with Compiler Optimizations*. Under review in Sustainable Computing: Informatics and Systems. Elsevier. (**Outcome of research stay in University of Alberta**) (**IF 3.8, CiteScore 10.7, Q1**, 2025).

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: https://doi.org/10.1016/B978-0-323-90386-8.00122-4

INTERNATIONAL CONFERENCE PAPERS

C14. Aragón-Jurado J. M.; de la Torre J. C.; Ruiz P.; Dorronsoro B. *Optimizing Doom for Steam Deck: Automated Engine Tailoring for Optimal Frame Rate*. 2025 IEEE Conference on Games (CoG). IEEE. 2025. Lisboa, Portugal. (**CORE C**, 2025)

C13. de la Torre J. C.; **Aragón-Jurado J. M.**; Jareño J.; Dorronsoro B.; Ruiz P. *A Two-step Approach to Find Short Compilation Transformation Sequences for Optimal Software Runtime Performance*. In Proceedings of the Genetic and Evolutionary Computation Conference Companion. ACM. 2025. Málaga, Spain. (**CORE A***, 2025)

C12. Kalaica M.; **Aragón-Jurado J. M.;** Jakus I.; Dorronsoro B.; Ruiz P. *Comparison on the use of Hybrid and Plugin Hybrid Electric Buses for Sustainable Urban Transportation - Split Use Case*. 10th North American Conference on Industrial Engineering and Operations Management (2025 IEOM). 2025. Orlando, Florida, USA.

C11. Aragón-Jurado J. M.; de la Torre J. C.; Ruiz P.; Dorronsoro B. *Automatic Generation of Greener Software Program Versions with Genetic Algorithms*. International Conference in Optimization and Learning (OLA2025). 2025. Dubai, United Arab Emirates.

C10. 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: https://doi.org/10.1109/CEC60901.2024.10612116 (**CORE B**, 2025)

C9. Aragón-Jurado J. M.; Dorronsoro B.; Ruiz P. *Bus Route Segmentation for Performance Optimization Using Geographical Mapping Tools*. INGEGRAF 2024. Lecture Notes in Mechanical Engineering. Springer, Cham. Valencia, Spain. DOI: https://doi.org/10.1007/978-3-031-72829-7_60

C8. 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: https://doi.org/10.1109/IPDPSW63119.2024.00160 (**CORE A**, 2025)

C7. de la Torre J. C.; **Aragón-Jurado J. M.**; Jareño J.; Ruiz P.; Dorronsoro B. *Software Performance Optimization with Genetic Algorithms.* Tenth Spanish-German Symposium on Applied Computer Science (SGSOACS 2024). 2024. Cadiz, Spain.

C6. Jareño J.; **Aragón-Jurado J. M.**; de la Torre J. C.; Dorronsoro B.; Ruiz P. *Management of Zero Emissions Zones in Urban Transport by Means of Neuroevolution*. Tenth Spanish-German Symposium on Applied Computer Science (SGSOACS 2024). 2024. Cadiz, Spain.

C5. Ruiz P.; **Aragón-Jurado J. M.**; Cabrera J. F.; de la Torre J. C.; Dorronsoro B. *Battery Management Strategies Optimization for Urban Plug-in Hybrid Buses*. International Conference in Optimization and Learning (OLA2024). 2024. Dubrovnik, Croatia.

C4. Aragón-Jurado J. M.; de la Torre J. C.; Ruiz P.; Dorronsoro B. *Automatic Software Performance Optimization using Genetic Algorithms*. International Conference in Optimization and Learning (OLA2024). 2024. Dubrovnik, Croatia.

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. Cadiz, Spain. DOI: https://doi.org/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: https://doi.org/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

NC9. Vázquez-Rodríguez E.; **Aragón-Jurado J. M**.; de la Torre J. C.; Dorronsoro B. *Evolución de la infraestructura de compilación LLVM según las optimizaciones de código disponibles*. XXIX Jornadas de Ingeniería del Software y Bases de Datos (JISBD 2025). SISTEDES. 2025. Córdoba, Spain.

NC8. Pérez-Vargas A.; **Aragón-Jurado J. M.**; de la Torre J. C.; Dorronsoro B. *GreenLinux: Un sistema operativo para la medición precisa del consumo energético del software*. XXIX Jornadas de Ingeniería del Software y Bases de Datos (JISBD 2025). SISTEDES. 2025. Córdoba, Spain.

NC7. de la Torre J. C.; **Aragón-Jurado J. M.**; Jareño J.; Dorronsoro B.; Ruiz P. *Optimización en dos pasos del rendimiento del software usando transformaciones de compilación*. XVI Congreso Español de Metaheurísticas, Algoritmos Evolutivos y Bioinspirados. AEPIA. 2025. San Sebastián, Spain.

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 Cadiz. 2022. Cadiz, 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 Cadiz. 2022. Cadiz, Spain.

TEACHING EXPERIENCE

TEACHING ASSISTANT

Total hours delivered: 152

T5. Course/Subject: 2024-25 PERCEPTION. **Department/Center:** Department of Computer Engineering, University of Cadiz. **Hours delivered:** 24 (**Bachelor's level**)

T4. Course/Subject: 2024-25 MACHINE LEARNING. **Department/Center:** Department of Computer Engineering, University of Cadiz. **Hours delivered:** 36 (**Bachelor's level**)

T3. Course/Subject: 2023-24 PERCEPTION. **Department/Center:** Department of Computer Engineering, University of Cadiz. **Hours delivered:** 24 (**Bachelor's level**)

T2. Course/Subject: 2023-24 MACHINE LEARNING. **Department/Center:** Department of Computer Engineering, University of Cadiz. **Hours delivered:** 36 (**Bachelor's level**)

T1. Course/Subject: 2022-23 AUTOMATA THEORY AND FORMAL LANGUAGES. **Department/Center:** Department of Computer Engineering, University of Cadiz. **Hours delivered:** 32 (**Bachelor's level**)

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 Cadiz, Cadiz, Spain. 2022-05-06

L3. Reducing energy consumption of programs on Android smartphones using genetic algorithms. Bachelor of Science in Computer Engineering. University of Cadiz, Cadiz, Spain. 2021-09-29

L2. Parallel genetic algorithms for software optimization: an analysis of performance on different platforms. Bachelor of Science in Computer Engineering. University of Cadiz, Cadiz, Spain. 2021-09-29

L1. Parallel genetic algorithms: designs and applications. Bachelor of Science in Computer Engineering. University of Cadiz, Cadiz, Spain. 2021-09-29

OVERSEAS RESEARCH EXPERIENCE

RS2. Guest Researcher at Ritsumeikan University, Ibaraki, Japan. *April 2025 – June 2025*

Host: Prof. Ruck Thawonmas

Project Objective: Empirical study on the impact of compiler optimizations on the energy consumption of video game engines, focusing on optimizing the energy usage of the popular video game Doom.

Outcomes: Journal paper currently under review in *IEEE Consumer Electronics Magazine* – IEEE (**IF 3.7, CiteScore 10, Q2**, 2025).

RS1. Guest Researcher at the University of Alberta, Edmonton, Canada. *May 2024 – August 2024*

Host: Prof. Abram Hindle

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

Outcomes: Journal paper currently under review in *Sustainable Computing: Informatics and Systems* - Elsevier (**IF 3.8, CiteScore 10.7, Q1**, 2025).

INVOLVEMENT IN FUNDED RESEARCH PROJECTS

P4. Intelligent eco-driving solutions for sustainable mobility [PID2022-137858OB-I00]

National R&D Project | Ministry of Science and Innovation, Spain | **Team Member**

P3. Characterization of energy efficiency in the software/hardware binomial using multifractal analysis. [TED2021-131880B-I00].

National R&D Project | Ministry of Science and Innovation, Spain | **Team Member**

P2. Intelligent Generation of Sustainable Software - GENIUS [P18-FR-2399].

National R&D Project | Ministry of Economy, Innovation and Science of Andalucia. Spain | **Team Member**

P1. Intelligent Sustainable Urban Transportation Systems [RTI2018-100754-B-I00]

National R&D Project | Ministry of Science, Innovation and Universities, Spain | **Team Member**

AWARDS AND GRANTS

PAPER AND PRESENTATION AWARDS

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

Awarded for the paper "*Optimización automática del videojuego Doom para un rendimiento óptimo en Steam Deck*".

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

Awarded for the article "Optimal Battery Management Strategies for Plug-in Electric Hybrid Buses on Routes Including Green Corridor," published in Sustainable Cities and Society.

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

Recognized for the paper "*Multivariable Visualization Tool of the Performance of Plug-In Hybrid Electric Buses*."

FELLOWSHIPS

F1. 2021 National FPU Fellowship, competitive research grant awarded by the Spanish Ministry of Universities.

Prestigious and highly competitive national grant for doctoral studies, awarded based on academic excellence and research potential.

OTHER AWARDS

OA2. 2022 Extraordinary Master's Degree Award, awarded to the top student in the Master's program

Granted to the top-performing student in the Master of Research in Systems and Computing Engineering.

OA1. 2019 First Prize – atrÉBT! Entrepreneurship Competition (13th Edition), University of Cadiz.
Awarded for an innovative student-led technology project as part of a university-wide competition promoting entrepreneurship and innovation.

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

JOURNAL

R6. Reviewer for the journal: Journal of Supercomputing – Springer.

R5. Reviewer for the journal: Sustainable Computing: Informatics and System – Elsevier.

R4. Reviewer for the journal: Applied Soft Computing – Elsevier.

R3. Reviewer for the journal: Engineering Applications of Artificial Intelligence – Elsevier.

CONFERENCE

R2. Reviewer for the conference: IEEE Conference on Games (CoG) 2025.

BOOK

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

PROFESSIONAL MEMBERSHIP

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