Application as Host Institution for Species Scholarship 2026.

Institution: University of Extremadura, Spain.

Location: Centro Universitario de Mérida, Mérida, Spain.

Research Group: Grupo de Evolución Artificial.

Advisor: Francisco Fernández de Vega.

FFV-CV

Fracisco Fernández de Vega is a PhD Extraordinary Award 2001, Director of the Artificial Evolution Group of the University of Extremadura (UEX) since 2002 and chair of the Task Force on Creative Intelligence of the IEEE Computational Intelligence Society. He is a Full Professor in the area of Computer Architecture and Technology. He has been CIO of the UEx, Deputy Director of the University Center of Merida and Director of the Ceta-Ciemat Chair of the UEx. FFV has been granted four six-year term research evaluations.

He has published 40 JCR articles, with more than 2800 citations collected in Google Scholar, and h-26 index. He is among the 30 scientists with more publications in Genetic Programming (among more than 4000 collected by the Genetic Programming Bibliography http://gpbib.cs.ucl.ac.uk/gp-html/index.html). He has been Principal Investigator of 14 competitive projects, including European, National and Regional ones.

FFV has organized international workshops and chaired tracks in some of the most important conferences of the areas in which he works, such as ACM GECCO, IEEE ICPP, IEEE CEC, IEEE WCCI, IEEE PACT. He was local chair of EvoStar 2020, Sevilla (online), and co-editor of this conference for 8 years. He has also organized several national conferences, including the MAEB conference in its first and tenth edition (AEB 2002 and 2015) in Mérida, as well as the CASEIB 2003, also in Mérida.

He and his PhD students have received awards for the best papers from several relevant conferences: PPSN 2002 best poster award; Evohot 2008 best paper award; ACM Gecco PhD student workshop 2007 best paper award, Philadephia, etc. He has received the ACM Gecco Evolutionary Art, design and creativity competition award in 2013, Amsterdam; Linextremix International Award 2006, Spain; Best AI App, Spanish Association for Artificial Intelligence, 2021, as well as nominations for best article in multiple congresses: IEEE CEC 2013, EvoMusart 2013, etc. His artworks have been internationally selected at Show Your World Competition 2017, New York, and Art Galleries around the world: Back Project Gallery, Vancouver; Gallerie Louchard, Paris; MC Gallery, New York. He collaborated with Sultana Fillms in the the Sultanas Dream Movie, awarded with the Contrechamp Grand Prix en Annecy 2024.

FFV has given conferences and international tutorials: University of California in San Diego, New Orleans IEEE Section, IEEE CEC Portland, Edinburgh and Beijing, University of Luxembourg, CERN, Bicentennial University of Mexico, Centro de Investigación y Educación Superior de Ensenada, Mexico, Universidad Autónoma Metropolitana, México, etc.; He has given invited conferences at University of the Basque Country, University Complutense of Madrid, University of Seville, University of Granada, University of Malaga.

FFV has been awarded as Outstanding Researcher in Evolutionary Computation in 2026 by the Species Society.

GEA Research Group

The Artificial Evolution Group at the University of Extremadura is a multidisciplinary group dedicated to the development and application Evolutionary Computation in combination with parallel and distributed computing, with a particular focus on computational creativity: art and music.

The group has several research areas centered on agriculture, health, artistic design, music, and the study of energy efficiency, all approached through computational intelligence.

Among the projects publicly available, Sharpmony is used by Music Conservatories, their teachers and students: more than 4800 users have already registered. Sharpmony allows SATB harmonization by evolutionary means.

The group leader, FFV, has advise PhD students from Spain, Portugal, Italy and Mexico. Members of the group have won: EvoHot best paper 2006; ACM GECCO Art Design and Creativity Competition 2013; Best PhD student paper at ACM Gecco 2012; nominated as Outstanding student Evostar 2024 and 2026.

Very recently, they have entered the Federated Learning field with applications to optical music recognition.

Research Proposal

Very recently, members of the GEA group have developed two interconnected algorithms and technology:

- Evolutionary Approach to SATB harmonization. For the first time a software tool is available to explore SATB harmonization that provides free error SATB compositions corresponding to a given melody, in reasonable running times: within the range of minutes to some hours, depending on the complexity of the problem.
- FedGP: New Genetic Programming approach to Federated Learning. Instead of relying in more traditional approaches, such as FED-AVG or FED-PROX, the new proposal applies Genetic Programming to produce Federated Learning aggregation. Applications to Optical Music Recognition are under development.

Both techniques are still in progress, and we plan new developments in the short term:

- Counterpoint evolution: Relying in evolutionary based SATB harmonization, we plan to develop counterpoint evolution, where the goal is to develop 1st, 2nd, 3rd, 4th, and 5th Species counterpoint.
- Including FedGP in Flower: In order to better text and extend possibilities for FedGP, we plan to develop a kit to be included within Flower, a well know and widely used package devoted to FL. Moreover, extensive testing is to be conducted in the Optical Music Recognition area.
- Evaluation of privacy risks in Genetic Programming-based Federated Aggregation. While FedGP has shown robustness against noisy and malicious client updates, its privacy implications remain largely unexplored. This project investigates whether exchanging local model weights in FedGP may expose sensitive information and studies practical mitigation strategies that can be integrated without compromising the adaptive nature of the aggregation process.

For interested readers, all the papers published related to the above described techniques and algorithms are available at: https://sharpmony.unex.es/index.php?r=info%2Finvestigacion

According to the profile of the student, during the stay, some of previous ideas will be explored and developed.

Venue

Mérida is mid-size touristic city plenty of cultural activities during the year.

The “Centro Universitario de Mérida”, is a mid-size college in a small campus -one of the four campuses belonging to the University of Extremadura in the region, offering 6 Bachelor Degrees, including Computer Science and two Master degrees. Our research group lead a research lab where PhD and Master students have the opportunity to work and develop their research within the campus.

Although students are free to look for apartments to stay during the scholarship, another possibility is available that we would check if the scholarship is awarded: A European Hostel for Young Researchers is available in Almendralejo, just 25 km far from Merida and connected by trains and buses. The possibility of FREE use of this hostel -managed by the Town Hall- will be study. In previous years Mexican students visiting our research grouped stayed there. For additional information check: https://www.almendralejoempresarial.com/contenido.php?id_area=30