Fernan Rodrigo Pérez Gálvez, PhD

Biotechnology Researcher & Experimental Data Analyst

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Profile

Biotechnology researcher with 7+ years of experience in **experimental biology, genetic engineering, and computational data analysis**. Skilled in integrating **visual behavior recognition**, **biosignal interpretation**, and **IoT-based sensor systems** for animal health and stress detection. Experienced in designing field and laboratory experiments, developing AI-ready datasets, and leading interdisciplinary collaborations between engineers, biologists, and industry stakeholders.

Core Competencies

- Visual data analytics: Image/video-based behavior recognition, biometrics, and motion tracking.
- Biosignal analysis: Growth rate estimation, physiological performance metrics, thermal tolerance profiling.
- IoT & sensor systems (Arduino): Deployment, calibration, and integration of environmental sensors.
- Machine learning: Dataset preparation, annotation, statistical modeling (GLMs), Python-based automation.
- Experimental design: Multi-modal stress detection pipelines (ecological stress on transgenic insects).
- Project leadership: Cross-disciplinary team coordination, mentoring, and communication.

Academic Degrees & Research Positions

Postdoctoral Associate, USDA-ARS & University of Florida, USA 2023–2025

- Designed and implemented CRISPR–Cas9 editing protocols for insect model *Anastrepha suspensa*.
- Drafted **image-based phenotyping workflows** and **bioassay data pipelines** for environmental stress detection.
- Led sensor-based environmental manipulation experiments assessing gene–environment interactions.

PhD in Zoology (Entomology), University of Kentucky, USA 2018–2023

- Established high-throughput **video-based thermal tolerance assays** with open-source tracking.
- Integrated physiological data with environmental variables to evaluate performance under stress.
- Developed automated computational pipelines for scoring animal bioassays (ImageJ).

MSc in Plant Biotechnology, CINVESTAV, Mexico 2015–2017 **BSc in Biotechnology**, ITESM, Mexico 2011–2014

Selected Technical Skills

- **Visual analytics:** OpenCV, ImageJ, video tracking, movement/posture detection.
- **Machine learning:** Python, scikit-learn.
- **Data science:** R, GLMs, experimental design, reproducible analysis workflows.

Publications & Selected Presentations

Perez-Galvez, F.R., Teets, N.M., et al. (2025). Abiotic conditions can modify the penetrance of transgene-based lethality systems for insect population control. *Proceedings of the Royal Society B*, **292**(2025307). https://doi.org/10.1098/rspb.2025.0307
This study investigates how environmental factors influence the effectiveness of genetic biocontrol systems in insects, with implications for improving pest management strategies.

Perez-Galvez, F.R., Zhou, S., Wilson, A.C., et al. (2023). Scoring thermal limits in small insects using open-source, computer-assisted motion detection. *Journal of Experimental Biology*, **226**(22), jeb246548. https://doi.org/10.1242/jeb.246548
Development of automated video-based bioassays to quantify thermal tolerance, enabling high-throughput phenotyping of insect physiological responses.

Co-author (2020). *Do we really need pesticides?* TED-Ed Lesson. https://ed.ted.com/lessons/do-we-really-need-pesticides-fernan-perez-galvez
Science communication project explaining the role and challenges of pesticide use in agriculture for a broad audience.

Selected International Presentations:

- *Entomological Society of America (ESA)* Annual Meeting, Denver, CO, USA (2021). "Computational estimation of biological activity in thermal performance bioassays."
- *Gordon Research Conference on Genetic Biocontrol*, Ventura, CA, USA (2022). "Evolutionary response to genetic biocontrol using embryonic conditional lethality."
- *FAO/IAEA Joint Research Coordination Meeting*, Vienna, Austria (Virtual, 2024). "Target genes for male sterility, sexing and visible markers in Drosophila suzukii and Anastrepha suspensa."
- *Congreso Internacional y Nacional de Ciencias Ambientales*, Guadalajara, México (2025). "Environmental influences on Sterile Insect Technique effectiveness."

Mentoring & Leadership

- Supervised high school and undergraduate students on computational estimation of physiological limits, sensor-based experiments, and image analysis pipelines.
- Led cross-cultural, multi-stakeholder scientific collaborations.
- Former Treasurer, Graduate Entomology Club, University of Kentucky.

Languages

- Spanish (Native)
- English (TOEFL iBT: 107/120)

References

Available upon request.