

# Carly Chery

Computational Agricultural Sciences · Ordinal Deep Learning for Smallholder Food Systems

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## ACADEMIC PROFILE

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Final-year BSc in Agricultural Sciences at *EARTH University* (Costa Rica, GPA 9.2/10). My research asks how ordinal-grading vision models can be designed to work across plant, livestock, and postharvest problems under the triple scarcity of labels, compute, and connectivity that defines smallholder tropical agriculture. I seek a funded MSc that extends ordinal-regression and image-analysis methods from coffee-leaf disease (my BSc thesis) to animal phenotyping and precision-agriculture decision support.

## EDUCATION

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***EARTH University*** 2023 – 2026 (expected)

BSc Agricultural Sciences · GPA 9.2 / 10

Guácimo, Limón, Costa Rica — Interdisciplinary focus on agroecology, food systems, and computational methods.

***EARTH University* — Bachelor's Graduation Project** 2026

*Deep Learning for Quantifying Severity of *Mycena citricolor* (Ojo de Gallo) and *Hemileia vastatrix* (Roya) in Coffee Using Leaf Image Analysis*

Supervisor: Prof. Víctor Hugo Morales Peña

Deep-learning pipeline integrating SegFormer (MiT-B3) for lesion segmentation and FastViT-T8 with DINOv2 knowledge distillation for ordinal severity grading, trained with CORN ordinal loss. Validated against expert phytopathologists using quadratic-weighted kappa and Stuart–Maxwell tests; designed for on-device inference on smartphones.

## AWARDS & SCHOLARSHIPS

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***EARTH University Full Merit Scholarship — W. K. Kellogg Foundation*** 2023 – 2026

Full merit scholarship by competitive international selection; covers tuition, housing, and fees.

***EARTH University Award for International Representation*** 2025

Recognised for representing the university at international academic events worldwide.

***Auburn University Research Internship*** 2025

Competitive placement, E.W. Shell Fisheries Center; Integrated Aquaponics Research Program.

***Harvard Project for Asian and International Relations (HPAIR) — Invited Delegate & Speaker*** Feb 2024

Competitive international selection; invited delegate and oral presenter (*RflowLabs*).

## RESEARCH & COMPUTATIONAL PROJECTS

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***RflowLabs* — Open-source Research Toolkit for Reproducible Analysis** 2023 – Present

Founder & Lead Developer · Active users in academic and research settings

- Developed an R-based toolkit integrated with RStudio to support reproducible multivariate and regression analyses on biological datasets, with structured templates for scientific documentation.
- Presented work at the Harvard Project for Asian and International Relations (HPAIR) at *Harvard University* (oral presentation, Feb 2024).

***Mi Salvador* — Population Genetics Simulation Platform** Jan 2024 – Present

Founder & Principal Developer · International user base

- Designed and deployed a browser-based platform simulating Mendelian inheritance and quantitative trait variation across generational cohorts. Published openly at *EARTH University* and used by undergraduate genetics students in their coursework since 2024.
- Developed probabilistic models of genotype–phenotype distributions for applications in plant breeding education and research training.

## RESEARCH & PROFESSIONAL EXPERIENCE

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### ***EARTH University* — Topographic Survey Team Leader**

Jan 2026 – Present

Precision Field Measurement & Agricultural Land Mapping

- Led a student research team in systematic field data acquisition for topographic and agricultural land-use mapping projects.
- Coordinated geospatial measurement campaigns supporting land resource management and agroecological planning.

### ***Auburn University* — Research Intern**

Sep – Dec 2025

E.W. Shell Fisheries Center · Integrated Aquaponics Research Program · Auburn, Alabama, USA

- Conducted experimental research on integrated aquaponic systems coupling tilapia production with greenhouse tomato cultivation; collected and analysed water-quality, yield, and fish-health data.
- Applied biometric monitoring protocols and contributed to data pipelines for real-time system performance evaluation.
- Collaborated within a multidisciplinary team of fisheries scientists and plant biologists.

## COMMUNITY ENGAGEMENT

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### ***Écolo Jeune* — Member, Youth Collective for Community Change**

2018 – Present

Les Cayes, Haiti · Progressive youth group driving community development initiatives.

### ***EARTH University* — Sea Turtle Conservation Station, Limón**

May 2025

Volunteer field researcher; monitored 20+ leatherback and green-turtle nesting events and coordinated hatchling-release protocols.

## PUBLICATIONS

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*Chery, C., & Morales Peña, V. H. Ordinal severity grading of coffee leaf disease via knowledge-distilled vision transformers.* 2026

Manuscript in preparation (first author). Target: *Computers and Electronics in Agriculture* or *Agriculture*.

## SELECTED PRESENTATIONS

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***RflowLabs: AI-integrated scientific workflows for agricultural data analysis and reproducible research in low-resource settings***

Feb 2024

Oral presentation, Harvard Project for Asian and International Relations (HPAIR), *Harvard University*.

## TECHNICAL SKILLS

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<b>Machine Learning</b>	PyTorch, HuggingFace Transformers, MMSegmentation, knowledge distillation, ordinal regression (CORN), transfer learning, self-supervised learning (DINOv2).
<b>Programming</b>	Python, R, HTML, CSS.
<b>Development</b>	Git, GitHub, Google Colab Pro, Jupyter, VS Code.
<b>Statistics &amp; Data</b>	pandas, NumPy, scikit-learn, tidyverse, ggplot2, bootstrap confidence intervals, Bayesian methods.
<b>GIS &amp; Remote Sensing</b>	QGIS, geospatial analysis, topographic surveying.
<b>Bioinformatics</b>	Population-genetics simulation, biological data analysis.

## LANGUAGES

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**French** — Native · **Haitian Creole** — Native · **English** — Fluent · **Spanish** — Fluent

## REFERENCES

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### **Dr. Desmond R. Layne**

*Research Internship Supervisor*  
Head & Professor, Department of Horticulture  
*Auburn University*  
drl0021@auburn.edu

### **Dr. Víctor Hugo Morales Peña**

*Graduation Project Supervisor*  
Ph.D. Agricultural Sciences (UCR);  
Professor of Tropical Forestry &  
Director, Geomatics Center  
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### **Mollie R. Smith**

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