

# EDWIN SOLARES

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## EDUCATION

<b>Ph.D. in Ecology and Evolutionary Biology</b> , University of California, Irvine, CA	<b>August 2021</b>
<b>M.S. in Biology</b> , University of California, Irvine, CA	<b>February 2019</b>
<b>B.S. in Biomedical Computing (Computer Science)</b> , University of California, Irvine, CA	<b>June 2014</b>

## PROFESSIONAL EXPERIENCE

<b>Machine Learning Engineer, Research &amp; Development</b> , Informuta, Inc., San Diego, CA	<b>Oct 2024 – Present</b>
<i>AI-driven predictive diagnostics for antimicrobial resistance forecasting (Nature Communications, 2024)</i>	
• Developed deep neural network models (TensorFlow, PyTorch Lightning) for antimicrobial resistance detection, achieving >80% accuracy, recall, and precision across multiple genomic datasets	
• Architected scalable cloud computing infrastructure (AWS Batch, >10K concurrent jobs) for parallelized ML inference and high-throughput genomic data processing	
• Engineered GPU-optimized compute pipelines with CUDA, reducing runtime by up to 95% for large-scale unsupervised ML and sequence analysis workloads	
• Designed novel string similarity algorithms for high-throughput genomic feature mapping and resistance marker identification	

## FELLOWSHIPS & SCHOLARSHIPS

<b>University of California President's Postdoctoral Fellowship (Evo &amp; CS Dept \$122,602)</b>	<b>2021 - 2023</b>
<b>University of California President's Pre-Professoriate Fellowship (\$57,727)</b>	<b>2020 - 2021</b>
<b>National Science Foundation Graduate Research Fellowship Program (\$138,000)</b>	<b>2017 - 2020</b>
<b>National Science Foundation Bridge to the Doctorate Fellowship (\$82,250)</b>	<b>2015 - 2017</b>
<b>IMSD-MBRS Summer Scholar (\$5,000)</b>	<b>2015</b>
<b>Southern California Edison Scholarship (\$15,000)</b>	<b>2011 - 2013</b>

## GRANTS & AWARDS

<b>University of California President's Postdoctoral Fellowship Hiring Incentive (\$425,000 Available Upon Hire &amp; spread over 5 years)</b>	<b>Date of Hire</b>
Western Regional Aquaculture Center: Reducing costs in Sturgeon Aquaculture: AI-Assisted Sex Determination and Strategic Innovations - Lead PI & Writer - ( <b>\$465,851</b> )	<b>2025 - 2028</b>
California Climate Action, Resilience, and Environmental Sustainability - Lead PI & Writer - ( <b>\$50,000</b> )	<b>2024</b>
Eurosemillas Industry Grant Sub-award: AI in Avocado Scion Program – Co-PI & Writer – Full Award: \$429,001 of a larger \$2.9M grant ( <b>Sub-award: \$83,610</b> )	<b>2023 - 2024</b>
NSF ACCESS Explore Allocation: Teaching and Training Big Data on a High Performance Computing Platform in the Classroom using Spark on the San Diego Super Computing Cluster Sustainability - Lead PI & Writer - ( <b>\$1,339</b> )	<b>2023 - 2024</b>
NSF ACCESS Discover Allocation: Species Rescue and Rapid Low Cost Assembly of Food for Structural Variant Detection using Artificial Intelligence Sustainability - Lead PI & Writer - ( <b>\$8,225</b> )	<b>2023 - 2024</b>
XSEDE Start-up Allocation Renewal: Rapid Low Cost Assembly of Food Crops and Drosophila for Structural Variant Detection using Intelligent Systems- Lead PI & Writer - ( <b>\$5,391</b> )	<b>2020 - 2023</b>
XSEDE Research Allocation: A genetic and population analysis of <i>Persea americana</i> local cultivars: Understanding the Genetic and Structural landscape of Avocados- Co PI & Writer - ( <b>\$5,408</b> )	<b>2019 – 2020</b>

XSEDE Start-up Allocation Renewal: Rapid Low Cost Assembly of Food Crops and Drosophila for Structural Variant Detection- Lead PI & Writer - (\$2,768)	2019 - 2020
XSEDE Start-up Allocation: Rapid Low Cost Assembly of Food Crops and Drosophila for Structural Variant Detection- Lead PI & Writer - (\$2,790)	2018 - 2019
Plant and Animal Genomics Conference: Asia Travel Award	2017
Seoul National University Travel Award	2018
Department of Ecology and Evolutionary Biology Travel Award	2017
XSEDE: Long-sequencing-read-based genome assemblies and the characterization of structural chromosomal variation in Diptera – Writer - (\$20,926)	2015
Pacific Biosciences Travel Award PAG & ASHG	2014
Broad Institute Computational Genomics Workshop Travel Award	2014
Undergraduate Research Opportunities Program Travel Award	2014
Information and Computer Science Excellence in Research	2014
Information and Computer Science Honors	2014
FASEB MARC Travel Award	2012

## PUBLICATIONS

- **PUBLISHED (IF FIRST AUTHOR)**

- (8) Martin, G., **Solares, E. A.**, Muyle, A., Guardado-Mendez, J., Bousios, A., Gaut, B. S. (2023). miRNA-like secondary structures in maize (*Zea mays*) genes and transposable elements correlate with small RNAs, methylation, and expression. *Genome Research*, gr.277459.122. <https://doi.org/10.1101/gr.277459.122>
- (7) Chan, G., Gracey, A.Y., **Solares, E. A.**, Wherle, B., Connor, K.M. Cycle of Heat Exposure Elevate Metabolic Enzyme Genes and Alters Digestion in Mussels. *Frontiers* (2023) <https://doi.org/10.3389/fmars.2023.1120695>
- (6) Chakraborty, M., Guadalupe Lara, A., Dang, A., McCulloch, K. J., Rainbow, D., Carter, D., **Solares, E. A.**, Said, I., Corbett-Detig, R., Gilbert, L. E., Emerson, J. J., Briscoe, A. D. (2023). Sex-linked gene traffic underlies the acquisition and loss of sexually dimorphic UV color vision in *Heliconius* butterflies. *PNAS* (2023) <https://doi.org/10.1073/pnas.2301411120>
- (5) **Solares, E.**, Morales-Cruz, A., Figueroa Baldera, R., Focht, E., Ashworth, V. E. T. M., Minio, A., Cantu, D., Arpaia, M.L., Gaut, B. S. Insights into the domestication of avocado and potential genetic contributors to heterodichogamy. *G3* (2022) <https://doi.org/10.1101/2022.03.30.486474>
- (4) **Solares, E. A.**, Tao, Y., Long, A. D., Gaut, B. S. HapSolo: An optimization approach for removing secondary haplotigs during diploid genome assembly. *BMC Bioinformatics* 22, 9 (2021) <https://doi.org/10.1186/s12859-020-03939-y>
- (3) Zhou, Y., Minio, A., Massonnet, M., **Solares, E. A.**, Lv, Y., Beridze, T., Cantu, D., Gaut, B. S. The population genetics of structural variants in grapevine domestication. *Nat. Plants* 5, 965–979 (2019) <https://doi.org/10.1038/s41477-019-0507-8>
- (2) **Solares, E. A.**, Chakraborty, M., Miller, D. E., Kalsow, S., Hall, K., Perera, A. G., ... Hawley, R. S. (2018). Rapid Low-Cost Assembly of the *Drosophila melanogaster* Reference Genome Using Low-Coverage, Long-Read Sequencing. *G3: Genes, Genomes, Genetics* (2018) 8(10), 10 3143–3154. <https://doi.org/10.1534/g3.118.200162>
- (1) Clifton, B. D., Librado, P., Yeh, S.-D., **Solares, E. S.**, Real, D. A., Jayasekera, S. U., ... Ranz, J. M. (2017). Rapid Functional and Sequence Differentiation of a Tandemly Repeated Species-Specific Multigene Family in Drosophila. *Molecular Biology and Evolution*. <https://doi.org/10.1093/molbev/msw212>

- **PREPRINT (IF FIRST AUTHOR)**

- (10) Groh, J. S., Soares dos Santos, M. F., Avila de Dios, E., Ackerman, G., **Solares, E.**, Focht, E., Seymour, D., Gaut, B. S., Arpaia, M. L., Coop, G. (2025 Preprint). Balanced polymorphism in a floral transcription factor underlies an ancient rhythm of daily sex alternation in avocado. *Biorxiv* 2025.12.22.695989. <https://doi.org/10.16489/2025.12.22.695989>
- (9) Hubbard, A., **Solares, E. A.**, Bradley, L., Jeang, B., Yewhalaw, D., Janies, D., Lo, E., Yan, G., Hemming-Schroeder, E. (2025 Preprint). PvGAP: Development of a globally-applicable, highly-multiplexed microhaplotype amplicon panel for *Plasmodium vivax*. *Medrxiv* 2025.04.30.25326751. <https://doi.org/10.1101/2025.04.30.25326751>

## PRESENTATIONS

- **CONFERENCE TALKS**

- (9) "Insights into the genetic contributors of flowering and recent clonal variants in avocado for creation of a more sustainable avocado"

University of California Santa Cruz: Next Wave of Faculty in Genomics Invited Speaker (8) "Technology for the future: Leveraging Automation and Machine Learning for a better future"	<b>2023</b>
Avocado Brainstorm Conference: Brisbane, AUS Invited Speaker (7) "The genetics of Avocado Flowering"	<b>2023</b>
Avocado Brainstorm Conference: Brisbane, AUS Invited Speaker (6) "HapSolo: leveraging artificial intelligence for haplotype classification"	<b>2023</b>
Computational Genomics Summer Institute Short Talk (5) "Persea americana. Origin, history, population structure and heterodichogamy." <i>Plant Genomes Online Conference Selected Talk</i>	<b>2022</b>
(4) "Persea americana. Insights into the domestication of avocado and potential contributors to heterodichogamy."	
Academic Spring Retreat for President's and Chancellor's Postdoctoral Fellowship Programs (3) "Avocados: An investigation in Persea americana."	<b>2022</b>
Avocado Genetics Group Invited Speaker	<b>2021</b>
(2) "Genome assembly methods: from millions to \$1K"	
University of California, Irvine Winter Ecology and Evolutionary Biology Graduate Student Symposium (1) "Transcriptomic and structural variation analysis in natural populations of a major malaria vector, <i>Anopheles arabiensis</i> "	<b>2019</b>
University of California, Irvine Winter Ecology and Evolutionary Biology Graduate Student Symposium	
<b>• INVITED TALKS</b>	
(8) "Forging a Sustainable Future: Harnessing Bioinformatics and Artificial Intelligence to Ensure Food Security and Species Rescue in a Changing Climate"	
Rochester Institute of Technology	<b>2024</b>
(7) "My Journey: I also dream of becoming an Astronaut, but also an Assistant Professor at a UC"	
IDEA Center with NSBE, OSTEM, WIC, SWE, SHPE - Professional Evening with Industry – Invited Keynote	<b>2024</b>
(6) "Leveraging AI to Tackle Food Insecurity and Disease"	
AI Student Collective Invited Speaker	<b>2023</b>
(5) "Applying for the UC Presidential Postdoctoral Fellowship Program"	
SACNAS Grad and Postdoc Chapter Invited Speaker	<b>2023</b>
(4) "HapSolo: An optimization approach for removing secondary haplotigs during diploid genome assembly and scaffolding."	
Vertebrate Genome Project Invited Speaker	<b>2020</b>
(3) "Rapid low-cost assembly of <i>Drosophila melanogaster</i> reference genome using low-coverage, Long-Read Sequencing"	
Seoul National University Departmental Seminar: Invited Speaker	<b>2018</b>
(2) "Why we matter, why we should strive to get degrees and how I was able to do it as a single father from the hood"	
Los Angeles Communities Advocating for Unity, Social Justice, and Action, Charter School Invited Speaker	<b>2017</b>
(1) "Applying High Performance Computing in Research"	
California Alliance for Minority Participation High Performance Computing and Research Seminar	<b>2017</b>

**SERVICE**

Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) University of California Davis Grad Chapter – <b>Postdoctoral Representative</b>	<b>2021 - 2023</b>
Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) University of California Davis Undergrad Chapter – <b>Postdoctoral Advisor</b>	<b>2021 - 2023</b>
California Alliance for Minority Participation, Undergraduate & Research Center at the University of California Davis – <b>Postdoctoral Advisor</b>	<b>2021 - 2023</b>

School of Biological Science NSF GRFP Writing Workshop – University of California, Irvine – <b>Writing Tutor</b>	<b>2017 - 2019</b>
Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) University of California Irvine Grad Chapter – <b>Outreach Chair</b>	<b>2017 - 2018</b>
Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) – University of California, Irvine Grad Chapter – <b>Co-founder</b>	<b>2017 - 2018</b>
California Alliance for Minority Participation UC Irvine Orientation, Graduate School and Research QA – <b>Panelist</b>	<b>2017 - 2018</b>
Los Angeles Communities Advocating for Unity, Social Justice, and Action (LA CAUSA) STEM – <b>Outreach, Curriculum Advisor and Orientation Speaker</b>	<b>2017 - 2018</b>
Compton Unified School District and 1 Day Paint and Body Corp – Linux PC Setup and Donation – <b>Coordinator and Project Lead</b>	<b>2013</b>

**TEACHING****• LECTURES**

Computer Science & Engineering 150B – Intro to AI: Search and Reasoning – **IOR** – Fall 2025  
 Masters of Advanced Study in Data Science & Engineering 220 – Introduction to Machine Learning – **IOR** – 2025  
 Computer Science & Engineering 150A – Intro to AI: Probabilistic Reasoning and Decision-Making – **IOR** – Winter 2025, 2026 Summer 2025, Spring 2026  
 Data Science 232R – Big Data Analytics Using Spark – **IOR** – Spring 2024, 2025 & 2026, Winter 2025  
 Computer Science & Engineering 151A – Machine Learning: Learning Algorithms – **IOR** – Winter, Summer & Fall 2024, Summer 2025  
 Computer Science & Engineering 29 – Systems Programming and Software Tools – **IOR** – Spring 2025  
 Computer Science & Engineering 015L – Software Tools & Techniques – **IOR** – Fall 2023 & Spring 2024  
 Engineering & Computer Science 032A – Introduction to Programming – **IOR** – Fall 2023 & Spring 2024  
 First-Year Aggie Connect – We Search Research – **Facilitator** – Winter 2023  
 Engineering & Computer Science 171 – Machine Learning – **IOR** – Fall 2022  
 Computer Science 171 – Introduction to Artificial Intelligence – **Guest Lecturer** – 11 Lectures – 2018 through 2020  
 Computer Science 184A – Introduction to Bioinformatics – **Lecturer** – Fall 2017 & Fall 2018  
 Computer Science 184B – Advanced Topics in Bioinformatics – **Lecturer** – Winter 2018 & Winter 2019  
 Computer Science 189 – Project in Bioinformatics – **Lecturer** – Spring 2018 & Spring 2019

**• MENTORSHIP**

*7 Graduate Students Mentored*  
*Over 50 Undergraduate Students Mentored (Majority URM)*  
*4 Completed Honors Thesis*  
*3 High School Students Mentored*