Diana García Cortés

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ddiannae

Education

PhD Biomedical Sciences | National Autonomous University of Mexico (UNAM) – National Institute of Genomic Medicine (INMEGEN)　　　　2018 - 2023

MS Computer Science | National Autonomous University of Mexico (UNAM)　　　　2013 - 2016

BS Computer Science and Technology | Monterrey Institute of Higher Education (ITESM) Graduated with Honors　　　　2008 - 2012

Personal statement

I am a computational biologist and software engineer with experience in both academia and industry settings. My field of research is cancer systems biology and the application of network-based modeling for biological data.

Currently, I am part of the Breast Oncology Center Computational Biology group at Dana-Farber Cancer Institute. Our group focuses on analyzing both in-house and public datasets to study tumor evolution and heterogeneity. We aim to identify genomic features that influence disease progression and resistance to therapy in breast cancer.

During my PhD at the Computational Genomics Division at INMEGEN, supervised by Dr. Jesús Espinal, I studied transcriptional regulation in cancer using systems biology and network science. I published two first-author papers, with another one under review and I presented my work in several international conferences including NetSci 2019 and the NetBioMed Satellite in 2020. Additionally, I participated in the Women in Network Science (WiNS) seminar and the Complex Network Winter Workshop organized by the University of Vermont Complex Systems Center.

As a software engineer, I have contributed to multiple teams developing web applications for end users, engaging in all stages of the software development lifecycle—from requirements gathering to production deployment. These experiences have improved my teamwork skills and deepened my understanding of programming best practices and Agile methodologies for iterative development.

In teaching, I have delivered lectures to college students, collaborated with e-learning platforms, and provided tutoring. My courses have covered topics such as algorithms, web development, R programming, and the Linux terminal.

I am an advocate of women's inclusion in STEM and have actively contributed to this cause as a former member of the organizing team of Women Who Code and PyLadies communities in Mexico City. In these roles I co-organized several meetups and conferences, including the Women in Data Science Conference 2020.

Professional Experience

Computational Biologist II | Dana Farber Cancer Institute　　　　DEC 2023 – PRESENT / BOSTON, USA
I am part of the Breast Oncology Center Computational Biology group. We analyze genomic data to study mechanisms of resistance in breast cancer.

Software Engineer II | Thermo Fisher Scientific　　　　MAY 2016 – JAN 2018 / TIJUANA, MX
I had a full stack developer role, and for a few months also scrum master, for the team in charge of the Data Manager app for Thermo Fisher Cloud (now Thermo Fisher Connect)

Lead Developer | Synapbox　　　　AUG 2015 – APR 2016 / CDMX, MX
Synapbox is a web platform to evaluate multimedia using facial expression recognition and eye tracking. My responsibilities involved database design and back end development

Software Developer | Desarrollo Interactivo　　　　AUG 2014 – JUL 2015 / CUERNAVACA, MX
I conducted requirement analysis, database design, and full stack development for web applications

Teaching Activities

Teaching Instructor | Ubits
MAR 2022– OCT 2022
CDMX, MX
I prepared the content for the Introduction to Bash Programming and the Linux Command Line Interface course and presented the Introduction to Front End Web Development program for the e-learning platform Ubits

Teaching Instructor | PILARES Code School for Women
AUG 2020 - MAY 2021
ONLINE
Pilares is a program from the Government of Mexico City focused on teaching women the fundamental skills to be employed as web developers. I prepared the content and taught the Introduction to Linux and Introduction to Web Development courses

Course Instructor | CETYS University
JAN 2017 – MAY 2017
TIJUANA, MX
I prepared the content and lectured the Introduction to Bioinformatics course in the Computer Science Engineering program, following the *Bioinformatics Algorithms: An Active Learning Approach* book

Teaching Assistant | UNAM
AUG 2015 – DEC 2015
CDMX, MX
I was a Teaching Assistant for the Design and Analysis of Algorithms course in the MS in Computer Science program were we mainly studied graph theory algorithms

Leadership and honors

Participant in the 2022 Bristol Myers Squibb, Organization for Latino Achievement Mentorship Program
MAR 2022 – JAN 2023

Director of Women Who Code Mexico City, where I have led the organization of meetups, bootcamps, and programming study groups for women
AUG 2021 – APR 2024

Co-organizer of PyLadies CDMX, where I co-organized the Women in Data Science CDMX 2020 conference, in addition to several meetups
AUG 2019 - APR 2022

Outstanding Performance Award, Software Engineering Test 2012. National Center for the Evaluation of Higher Education.

Winner of the Microsoft Scholarship Program 2010-2011

Volunteering activities

Mentor at the Women Leaders in STEAM program for high school students
FEB 2022 – JUL 2023

Community tutor for junior high school students at Temixco, Morelos
AUG 2020 - DIC 2020

Community Teaching Assistant at eDX for the *Data Science: R Basics* course
NOV 2018 - JAN 2019

Tutor at PREPANET, online high school program from ITESM
AUG 2009 - MAY 2011

Skills

- Application of quantitative approaches to solve biological problems.
- Experience in analyzing as well as generating actionable insights from gene expression and other high-throughput molecular profiling data
- Ability to integrate heterogeneous data sources.
- Experience with network-based modeling approaches and knowledge of machine learning algorithms.
- Pipeline development, algorithmic implementation, statistical programming and data manipulation, using R/Bioconductor, python and open-source bioinformatics tools
- Web application development using Javascript and NodeJS, and SQL and NoSQL databases.
- Cloud computing using AWS, Continuous Integration/Continuous Delivery tools, and git.

Publications

García-Cortés, D., Hernández-Lemus, E. and Espinal-Enríquez, J., 2022. Loss of long-range co-expression is a common trait in cancer. bioRxiv

Dorantes-Gilardi, R., García-Cortés, D., Hernández-Lemus, E. and Espinal-Enríquez, J., 2021. k-core genes underpin structural features of breast cancer. Scientific Reports, 11(1), pp.1-17.

García-Cortés, D., Hernández-Lemus, E. and Espinal-Enríquez, J., 2021. Luminal a breast cancer co-expression network: Structural and functional alterations. Frontiers in genetics,12, p.629475.

García-Cortés, D., de Anda-Jáuregui, G., Fresno, C., Hernández-Lemus, E. and Espinal-Enríquez, J., 2020. Gene co-expression is distance-dependent in breast cancer. Frontiers in oncology,10, p.1232.

Dorantes-Gilardi, R., García-Cortés, D., Hernández-Lemus, E. and Espinal-Enríquez, J., 2020. Multilayer approach reveals organizational principles disrupted in breast cancer co-expression networks. Applied Network Science, 5(1), pp.1-23.

Dorantes-Gilardi, R., García-Cortés, D., Hernández-Ramos, H. and Espinal-Enríquez, J., 2020. Eight years of homicide evolution in Monterrey, Mexico: a network approach. Scientific reports,10(1), pp.1-20.

de Anda-Jáuregui, G., Fresno, C., García-Cortés, D., Enríquez, J. and Hernández-Lemus, E., 2019. Intrachromosomal regulation decay in breast cancer. Applied Mathematics and Nonlinear Sciences, 4(1), pp.223-230.

Conferences

NetSci 2020 | Loss of long-range gene co-expression is a common feature in cancer. Presentation at NetBioMed satellite
SEP 2020
ONLINE

NERCCS 2020 | A Network Approach to Cancer: Clustering Cell Lines by Gene Dependency Rank Distances. Poster presentation.tation.
APR 2020
ONLINE

3rd International Summer Symposium on Systems Biology | Gene regulatory networks display loss of trans-regulation in breast cancer molecular subtypes. Flash talk
AUG 2019
CDMX, MX

NetSci 2019 | Gene regulatory networks display loss of trans-regulation in breast cancer molecular subtypes. Poster presentation.
MAY 2019
BURLINGTON, US

ISCB-LA-SOIBIO-EMBNET Bioinformatics Conference 2018 | Loss of trans regulation in breast cancer molecular subtypes. Student council talk - main conference poster presentation.
NOV 2018
VIÑA DEL MAR, CH

Courses

Machine learning in Python with scikit-learn | Inria

Net-COVID: Understanding and Exploring Network Epidemiology in the Time of Coronavirus | COMBINE, University of Maryland and University of Vermont Complex Systems Center. Honorable Mention in project

Complex Networks Winter Workshop 2019 | University of Vermont Complex Systems Center and the Sentinel North Program of the Université Laval

III Summer School in Bioinformatics | Institute of Mathematics, UNAM