

# Carlos Roberto Cruz Maldonado

Computational Biologist | Network Scientist

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I'm a **Computational Biologist** specialized in **Network Sciences**. Currently I'm looking for opportunities to apply and enhance my technical background.

I'm particularly interested in using my skills in **Data Science**, **Data Analysis** and **Computational/Networks/Systems Biology** to solve interesting and challenging problems.

## Professional Goal

My **research interest** and **professional goal** emerge mainly from the understanding of **Network Science as a Data Science** and my passion to communicate and share knowledge.

By understanding networks, we manage to understand a little something about everything. So, I'm constantly looking forward into **having impact on society** and **enabling social well-being** through **developing technology** or **thought-provoking research**. That's why I enjoy being proficient in **programming**, **science communication**, **education** and working in **Interdisciplinary teams**.

## Education

### Bachelor of Science (BSc) in Biology

Universidad Nacional Autónoma de México

Aug 2011 - Jun 2015

### Doctor of Philosophy (PhD) in Biomedical Sciences

Universidad Nacional Autónoma de México

Aug 2017 - Present

## Technical Skills

- Strong Skills: **Python 2.7 - 3.8**, **R**
- Main Frameworks: **SciPy ecosystem (NumPy/SciPy/Matplotlib/IPython/Pandas)**, **Django (entry level)**
- Proficient Skills: **SQL**, **HTML**, **CSS**
- Other skills: **Data Mining/Scraping**, **Figma**, **Data retrieval from biological databases**, **Data Cleansing**, **Analysis & Visualization**, **Improve operations with APIs**, **Git**

## Work Experience

### Graduate Research Assistant

Systems Biology and Synthetic Biology Laboratory, Center for Genomic Sciences, UNAM (Jul 2017 - Present)

- Developing a framework for analyzing the self-similar fractal geometry of complex networks (bacterial gene regulatory networks) with **Python**

### Systems Biology Working Group

Undergraduate Program on Genomic Sciences, Center for Genomic Sciences, UNAM (Jan 2016 - Dec 2019)

- Collaborating with the PI on strategic projects or decisions
- Teaching and mentoring undergraduate students in Network Analysis with **Python**

### Teacher Assistant - Scientific Computing

Undergraduate Program on Genomic Sciences, Center for Genomic Sciences, UNAM (Jan 2017 - Jun 2017)

- Teaching and mentoring undergraduate students on design and analysis of algorithms, pointers and dynamic memory, object oriented programming and basic numerical methods with **Python**

### Teacher Assistant - Programming Principles

Undergraduate Program on Genomic Sciences, Center for Genomic Sciences, UNAM (Aug 2016 - Dec 2016)

- Teaching and mentoring undergraduate students on structured programming and basic data structures

### Undergraduate Research Assistant

Evolutionary Genomics Program, Center for Genomic Sciences, UNAM (Jun 2015 - Jun 2017)

- Network Analysis with **Python**, characterizing bacterial gene regulatory networks
- Developing a **Python** implementation of an alternative method to characterize fractal networks

### Research Intern

Two-component signal transduction laboratory, Institute of Cellular Physiology, UNAM (Aug 2014 - May 2015)

- Working under the supervision of Dr. Dimitris Georgellis on characterization of the BarA/UvrY TCS which is involved in bacterial virulence
- Experiments involved the use of molecular biology methods

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## Courses and Certifications

- Structure and Dynamics of Biological Networks  
Biomedical Sciences PhD, UNAM, 2021
- Introduction to Git  
Datacamp, 2020
- Academic Writing  
Biomedical Sciences PhD, UNAM, 2020
- Advanced Topics in Python  
Biomedical Sciences PhD, UNAM, 2020
- Research Ethics and Scientific Integrity  
Biomedical Sciences PhD, UNAM, 2018
- Programming Principles  
Biomedical Sciences PhD, UNAM, 2017
- International Course on Systems Biology  
Center for Biotechnological Research, UAEM, 2016
- Synthetic Biology Course  
Biological Engineering Laboratory, CINVESTAV, 2013
- XIV Fall School of Mathematical Biology and VIII National Gathering of Mathematical Biology  
Faculty of Sciences, UASLP, 2012
- Environmental Leadership Bootcamp  
Ecology Project International, 2009

## Presentations Experience

- "La simplicidad y belleza en la complejidad"  
Oral presentation at: Puertas abiertas CCG, Center for Genomic Sciences, UNAM; 2019; **Morelos, México**
- Fractal analysis of bacterial genetic regulatory networks  
Poster presented at: EMBL Conference From functional genomics to systems biology; November 2018; **Heidelberg, Germany**
- Fractal characterization of bacterial regulatory networks  
Poster presented at: VII International Symposium on OMICs and Bioinformatics; October 2017; **Varadero, Cuba**
- Self-similarity in bacterial regulatory networks: Insights into a novel organizational property conserved during evolution  
Poster presented at: V Congress on Biochemistry and Molecular Biology of Bacteria; October 2017; **Puebla, México**

- Self-similarity in bacterial regulatory networks: insights into a novel organizational property conserved during evolution  
Poster presented at: International Symposium on Functional Genomics and Systems Biology 2017; May 2017; **Morelos, México**
- Self-similarity in bacterial regulatory networks: insights into a novel organizational property conserved during evolution  
Poster presented at: EMBO Conference Series From functional genomics to systems biology; November 2016; **Heidelberg, Germany**
- "Skully coli: In vivo synthetic design for specific antimicrobial peptide targeting of pathogenic bacteria"  
Oral presentation at: International Genetically Engineered Machine Competition, Regional Jamboree: Latin America; October 2013; **Santiago, Chile**
- "How does climate change affects amphibians?"  
Oral presentation at: Teton Science School; August 2009; **Jackson Hole, WY, USA**

## Community Memberships

- Sistema Estatal de Investigadores de Baja California Sur  
August 2021

## Languages

- **English** - Professional working proficiency
- **Finnish** - Elementary proficiency
- **Spanish** - Native proficiency