Curriculum Vitae 2024

1 Personal Data

Name: Fernando Roa
E-mail: froao at unal.edu.co

2 Chronology

- In 2016 as a postdoc I wrote a shiny app to show chromosomal numbers and genome size of plant species, and also some statistical analyses such as regressions (9.2).
- Around 2019 also as a postdoc, I wrote a shiny app to plot idiograms which are representations of chromosomes (10.4).
- In 2021 I took the Data Science 'ds4a' course from CorrelationOne. See 10.2 and 15.3
- Starting 2022 I worked 16 months for Appsilon; one year of it I worked for an important pharmaceutical, adding features and resolving bugs in their shiny apps (6.1).
- The rest of the time in Appsilon, I worked in a biological app with maps of distributions of species in the project mbaza and I also refactored a Natural Language Processing app, that I had developed previously in a data science course, to use modules and to show it in the Appsilon Conference (10.2).
- During my time at Appsilon, I learnt how to use properly git and github, how to code in a team, the use of SCRUM, and I also learnt how to write modularized code (15.2).
- Recently I worked on several R personal projects, such as, ShinyInvoice (10.1) and gbif Taxon Distribution

3 Summary

I have worked as a contractor (B2B) building R-Shiny Apps for 1.5 years, including apps that generate reports from SQL data (mostly pharmaceutical - 6.1).

In addition, I have developed R-Shiny apps and packages related to biological research (Doctorate, Postdoc), including: idiogramFISH (10.4), CytoEvo (10.3) and Rmarkdown related (shinyInvoice - 10.1), more recently. Regarding Javascript, I used frequently to improve R-Shiny apps, and I took the RocketSeat course, solving the challenges (5.3).

I have designed and worked with databases (mongo, SQL), and used web-scraping of online html/json data by scripts (R, python). I have programmed in R, R-shiny, excel VBA, bash and python. I have several years of experience of data analysis during doctorate, Postdoc and more recently I took Data Science courses (15.1, 15.3).

I speak English (see TOEFL), Portuguese (lived > 10 y. in Brazil), Spanish (Native - Colombia) and some German (german highschool) (8.1, 8.2, 8.3).

4 Personal links

linkedIn: fernando-roa-422bb614
Curriculum: curriculumpu
Gitlab: ferroao
Github: fernandoroa
ORCID: 0000-0001-5940-4374
Stackoverflow: ferroao

5 Skill Development Period

5.1 **Python**   2024
Libraries: math, itertools
Challenges: github h_rank_challenges
Platform: Hacker_Rank
Begin: 02-2024   End: present

5.2 **R**   2024
Libraries: dplyr, fs, ggplot2, gridExtra, gtools, jsonlite, knitr, latex, lazyeval, lubridate, magrittr,
    quantmod, readr, rhino, rjson, rlang, Rmarkdown, rsconnect, scales, shiny modules,
    shinyAce, shinyjs, stats, stringr, tibble, tidyr, tidyselect
Products: github invoice-public, gitlab dotsViolin, github gbif_map_shiny
Begin: 06-2024   End: present

5.3 **JavaScript**   2023
Libraries: express, method-override, multer, nunjucks, pg-promise, pg, gulp
Challenges: github foodfy_rs_challenge, github async_rs_challenge
Platform: Rocketseat
Begin: 07-2023   End: 11-2023

6 Professional experience

6.1 **B2B - Full-time Shiny Developer - Home-Office - Appsilon**   2022-2023
Main roles: Shiny Interfaces and Backend
Projects: - Shiny Apps using Shiny modules
    - Backend and Frontend development for production of .pdf .docx reports, from SQL
    queries (support/fixes and adding features)
Technologies: docker, Jenkins, SQL, sass, Quarto
Libraries: dplyr, DT, ggplot2, glue, kableExtra, knitr, latex, lubridate, modules, ODBC,
    officedown, purrr, R6, Rmarkdown, scales, shiny, shiny.semantic, shinyAce, shinyBS,

shinyjs, stats, stringr, testthat, tibble, tidyr, yaml
Company: B2B -> Appsilon -> Pharmaceutical
Begin: feb-2022   End: may-2023

6.2 **Freelance R tutor**   2020-2021
Main activity: R Teaching, Support
Platform: superprof.com.br
Begin: feb-2020   End: dec-2021

6.3 **Freelance Translator**   2020-2021
Main activity: Translation
Platform: proz.com
Begin: feb-2020   End: dec-2021

6.4 **Post-doc**   2014-2020
Main roles: Researcher; Database development and management; dashboard (R-shiny)
development   Scholarship: CAPES
(5 years on scholarship + 1 year voluntary)
Projects: - Plant cytogenetics database of Cerrado
   - Reconstruction of ancestral characters in the phylogeny of Fabaceae and *Callisia* -
   Genome size of plants of Cerrado
Technologies: R, iqtree, revBayes, RepeatExplorer, mongodb
Libraries: badger, bib2df, bookdown, clipr, crayon, data.table, dplyr, DT, GGally, ggplot2,
   ggpubr, ggtree, grid, gridExtra, gtools, gtools, kableExtra, knitr, lazyeval, mongolite,
   network, phytools, plyr, rclipboard, Rcurl, readxl, RefManageR, rentrez, rhandsontable,
   rlang, Rmarkdown, rmdformats, robustHD, rvcheck, scales, shiny, shinydashboard, shinyjs,
   sna, stringr, tidyr, treeio
Inst. contact: +55-62-3521-1688
Begin: feb-2014   End: jan-2020

7 Main Degrees

7.1 **Doctorate**   2007-2011
Title: Plant Biology   Emphasis: Sistematics
Diploma date: jul-02-2012   Scholarship: CNPq - Research funding agency - Brazil
Universidade Federal de Pernambuco, Recife, Brazil
Thesis: Analysis of the distribution of 5S and 45S rDNA sites in plant karyotypes
Keywords: database, ribosomal DNA, FISH, molecular cytogenetics. Supervisor: Marcelo Guerra
Language: portuguese
Grade average: 4.3 (from 0.0 to 5.0)

7.2 **College**   1997-2005
Title: Biology   Emphasis: Genetics
Diploma date: sept-15-2005
Universidad Nacional de Colombia

Thesis: Cytogenetic analysis with 4MV X-radiation of cells of early onset Alzheimer patients and controls (Instituto de Genética Humana, PUJ)   Supervisor: Gloria Osorio, Marta Lucía Bueno

Keywords: cytogenetics, Alzheimer. Language: spanish

Grade average: 4.0 (from 0.0 to 5.0)   Distinctions: with honors, tuition payment exemption

8 Language proficiency

8.1 **English**
TOEFL-ITP; TOEFL   657/677; 103/120

C1; C1   2018; 2012

8.2 **Portuguese**
CELPE-BRAS   Higher intermediate

B2   2011

8.3 **German**
Sprachdiplom II   Passed

B2-C1   1995

9 Articles

9.1 Heterochromatic patterns of Citrus revisited: a new look at species origins and karyotype evolution   2023

Montenegro, Claudio; Roa, Fernando; dos Santos Soares Filho, Walter; Barros e Silva, Ana Emília. Tree Genetics & Genomes. 19. 36

doi 10.1007/s11295-023-01610-0   journal link

9.2 The Cerrado (Brazil) plant cytogenetics database   2017

Roa, Fernando; Telles, Mariana Pires de Campos. Comparative Cytogenetics. 11. 285-297

doi 10.3897/CompCytogen.v11i2.11395   journal link

Repo. links: gitlab cerradocytopu

Web-page: shinyapps.io

9.3 Non-Random Distribution of 5S rDNA Sites and Its Association with 45S rDNA in Plant Chromosomes   2015

Roa, Fernando; Guerra, Marcelo. Cytogenetic and Genome Research. 146. 243-249

doi 10.1159/000440930   journal link

9.4 Distribution of 45S rDNA sites in chromosomes of plants: structural and evolutionary implications.   2012

Roa, Fernando; Guerra, Marcelo. BMC Evolutionary Biology. 12. 225

doi 10.1186/1471-2148-12-225   journal link

9.5 Karyotype differentiation in three species of Tripogandra Raf. (Commelinaceae) with different ploidy levels   2010

Marques, André; Roa, Fernando; Guerra, Marcelo. Genetics and Molecular Biology. 33. 731-738

`doi` `10.1590/S1415-47572010005000085`   journal link

9.6 Cytotaxonomy of diploid and polyploid Aristolochia (Aristolochiaceae) species based on the distribution of CMA/DAPI bands and 5S and 45S rDNA sites   2009

Berjano, Regina; Roa, Fernando; Talavera, Salvador; Guerra, Marcelo. Plant Systematics and Evolution. 280. 219-227

`doi` `10.1007/s00606-009-0184-6`   journal link

10 Software: packages, scripts, pages

10.1 R package/ Shiny App: shinyInvoice: Shiny App - Generate a Pdf Invoice with 'Rmarkdown'

Repo. links: github invoice-public, CRAN shinyInvoice

Web-page: shinyapps.io

10.2 Python/R code; Shiny-App: NLP for community feedback

Repo. links: gitlab nlpfeedback, github NLPShiny_rhino_mod

10.3 Shiny-App: Cytogenetics characteristic evo modeling

Repo. links: gitlab cytoevopri

Web-page: shinyapps.io

10.4 R-package; Shiny-App: idiogramFISH: plot Idiograms and Karyotype indices

Repo. links: gitlab idiogramFISH, CRAN idiogramFISH

Web-page: shinyapps.io

Docs: gitlab.io

10.5 Rmarkdown: Curriculum

Repo. links: gitlab curriculumpu

Web-page: gitlab.io

10.6 R Scripts: Reading databases

Repo. links: gitlab getdatabase

10.7 Python/R scripts: linkScraping: Creating a .bib library from journal html pages

Repo. links: gitlab linkscraping

11 Courses taught

11.1 **Cytogenetics**   40h

Level: Graduate   2015.I

Universidade Federal de Goiás. Language: portuguese

11.2 **Cytogenetics**   64h

Level: College   2014.I

Universidade Federal de Goiás. Language: portuguese

12 Mentoring

12.1 **Undergraduate research**

Student: Daniella Rezende   01-08-2014 - 31-07-2015

Institution: Universidade Federal de Goiás

13 Talks in Events

13.1 Poliploidy and genome duplication Brazilian legumes   25-10-2019

70 Congresso Nacional de Botânica. Language: portuguese

Technologies: R, iqtree, revBayes, MAFFT, StableTraits

Maceió, Alagoas, Brazil

13.2 Cytogenetics for resolving evolutionary questions   27-04-2018

Encontro da liga acadêmica de genética. Language: portuguese

Technologies: R, iqtree, MAFFT

UFG. Goiânia, Brasil

13.3 Reconstruction of ancestral states of cytogenetic characters in Leguminosae

Reunião de citogenética do Brasil Central. Language: portuguese   20-10-2017

Technologies: R, iqtree, revBayes, MAFFT, StableTraits

UCG. Goiânia, Brasil

13.4 Database of Plant Cytogenetics. Current situation of the field   08-12-2016

Reunião de citogenética do Brasil Central. Language: portuguese

Technologies: R, mongoDB

UCG. Goiânia, Brasil

13.5 Distribution of 5S and 45S rDNA sites and implications   28-05-2012

II Simposio de Genética. Language: spanish

Technologies: R

Universidad del Quindío. Armenia, Colombia

13.6 Trends on the distribution of the 45S ribosomal DNA in plants   02-07-2010

Society for Experimental Biology Main Meeting

Technologies: R

Prague, Czech Republic

13.7 Cytogenetics and Molecular cytotaxonomy of species of genus Callisia Loefl. (Commelinaceae)   17-08-2007

II simposio Latinoamericano de citogenética y evolución. Language: spanish

UN, Palmira, Colombia

14 Abstracts in Annals

14.1 Splitting is the answer. Cytogenetics and systematics analyses of Callisia Loefl. (Commelinaceae)   Poster

Roa F, Pellegrini MOO, Vaio M, Guerra M   21-24 05/2019

VI Reunião Brasileira de Citogenética e Citogenômica. Goiânia

Technologies: R, mongoDB, MAFFT, iqtree, revBayes, StableTraits, FISH

14.2 The Cerrado Plant cytogenetics database   Poster

ROA, F; Telles, MPC   08-11/11/2016

IV Congresso Brasileiro de Recursos Genéticos. Curitiba

Technologies: R, mongoDB, cytometry

Anais do IV Congresso Brasileiro de Recursos Genéticos. Language: portuguese

14.3 Distribution of 5S and 45S rDNA sites in plant chromosomes   Talk

Guerra M, Roa F   23-25 04/2012

Gatersleben Research Conference. IPK Gatersleben, Germany

Technologies: R

Annals of the Gatersleben Research Conference. Page: 53

14.4 Trends on the distribution of the 45S ribosomal DNA in plants   Talk

Roa F, Guerra M   30-03 07/2010

Society for Experimental Biology Main Meeting. Prague, Czech Republic

Technologies: R

Annals of the SEB Meeting. Page: 262

15 Taken Courses and Workshops

15.1 Mathematics for Data Science and Machine Learning using R   10h

udemy - Eduonix   05 2024

Theoretical and Practical Course

15.2 Git and Github Bootcamp   17h

udemy   05 2023

Theoretical and Practical Course

15.3 Data Science for All (ds4a)   375h

Correlation One   20/05-10/09 2021

Focused on python libraries, and also using Jupyter notebooks, making data visualizations for exploratory data analysis and database management. The course also included the use of AI,

natural language processing, Decision Trees, k-nearest neighbors and convolutional neural networks among others. My certificate was honorific and my group's project involved NLP and was among the 10 best (from 90 groups).
Theoretical and Practical Course

15.4 Linux Course
Geek University https://geek-university.com   23/01-24/02 2020
Theoretical Course

15.5 Introducing python   80h
Universidade Federal de Goiás, Goiânia, Brasil   28/07-09/08 2019
Theoretical and Practical Course. Language: Portuguese

16 Personal references

16.1 Oriol Senan
Workplace: Appsilon

16.2 Michal Parkola
Workplace: Appsilon (previously)