Curriculum Vitae 2024

1 Personal Data
Name: Fernando Roa
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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 16.3
- 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 (16.2).
- 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 ().

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.

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

4 Personal links
linkedIn: https://www.linkedin.com/in/fernando-roa-422bb614/
Curriculum: https://ferroao.gitlab.io/curriculumpu/
Gitlab: https://gitlab.com/ferroao

Github: https://github.com/fernandoroa
ORCID: https://orcid.org/0000-0001-5940-4374
Stackoverflow: https://stackoverflow.com/users/6388753/ferroao

5 Skill Development Period

5.1 **Python** 2024
Libraries: math, itertools
Challenges: https://github.com/fernandoroa/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: https://github.com/fernandoroa/invoice-public,
https://gitlab.com/ferroao/dotsViolin, https://github.com/fernandoroa/gbif_map_shiny
Begin: 06-2024   End: present

5.3 **JavaScript** 2023
Libraries: express, method-override, multer, nunjucks, pg-promise, pg, gulp
Challenges: https://github.com/fernandoroa/foodfy_rs_challenge,
https://github.com/fernandoroa/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, 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`   http://dx.doi.org/10.1007/s11295-023-01610-0

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`   https://compcytogen.pensoft.net/article/11395/

Repo. links: https://gitlab.com/ferroao/cerradocytopu

Web-page: https://cyto.shinyapps.io/cerrado/

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`   https://www.karger.com/Article/FullText/440930

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`   http://www.biomedcentral.com/1471-2148/12/225

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`   http://dx.doi.org/10.1590/S1415-47572010005000085

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`   http://link.springer.com/10.1007/s00606-009-0184-6

10 Software: packages, scripts, pages

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

Repo. links: invoice-public, CRAN

Web-page: shinyapps.io

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

Repo. links: gitlab nlpfeedback, NLPShiny_rhino_mod

10.3 Shiny-App: Cytogenetics characteristic evo modeling

Repo. links: cytoevopri

Web-page: shinyapps.io

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

Repo. links: gitlab idiogramFISH, CRAN

Web-page: shinyapps.io

Docs: gitlab.io

10.5 Rmarkdown: Curriculum

Repo. links: curriculumpu

Web-page: gitlab.io

10.6 R Scripts: Reading databases

Repo. links: 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 Short Courses taught

13.1 **Evolution of cytogenetic characters in the phylogenetic context** 5h

VI Brazilian Meeting of Cytogenetics and Cytogenomics, Goiânia 21/05/2019

Language: portuguese

13.2 **Molecular and classic Citogenenetics in plants** 6h

XXV Week of ICB, Universidade Federal de Goiás 18-20/11/2014

Language: portuguese

14 Talks in Events

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

70 Congresso Nacional de Botânica. Language: portuguese
Maceió, Alagoas, Brazil

14.2 Cytogenetics for resolving evolutionary questions
27-04-2018

Encontro da liga acadêmica de genética. Language: portuguese
UFG. Goiânia, Brasil

14.3 Reconstruction of ancestral states of cytogenetic characters in Leguminosae

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

UCG. Goiânia, Brasil

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

Reunião de citogenética do Brasil Central. Language: portuguese
UCG. Goiânia, Brasil

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

II Simposio de Genética. Language: spanish
Universidad del Quindío. Armenia, Colombia

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

Society for Experimental Biology Main Meeting
Prague, Czech Republic

14.7 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

15 Abstracts in Annals

15.1 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

15.2 The Cerrado Plant cytogenetics database
Poster

ROA, F; Telles, MPC
08-11/11/2016
IV Congresso Brasileiro de Recursos Genéticos. Curitiba
Anais do IV Congresso Brasileiro de Recursos Genéticos. Language: portuguese

15.3 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
Annals of the Gatersleben Research Conference. Page: 53

15.4 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

Annals of the SEB Meeting. Page: 262

16 Taken Courses and Workshops

16.1 Mathematics for Data Science and Machine Learning using R — 10h

udemy - Eduonix — 05 2024

Theoretical and Practical Course

16.2 Git and Github Bootcamp — 17h

udemy — 05 2023

Theoretical and Practical Course

16.3 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

16.4 Linux Course

Geek University https://geek-university.com — 23/01-24/02 2020

Theoretical Course

16.5 Introducing python — 80h

Universidade Federal de Goiás, Goiânia, Brasil — 28/07-09/08 2019

Theoretical and Practical Course. Language: Portuguese

17 Personal references

17.1 Oriol Senan

Workplace: Appsilon

17.2 Michal Parkola

Workplace: Appsilon (previously)