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 14.3
- 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 (14.2).
- 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 (14.1, 14.3).

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: Systematics
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** 2018; 2012

TOEFL-ITP; TOEFL 657/677; 103/120
C1; C1

8.2 **Portuguese** 2011

CELPE-BRAS Higher intermediate
B2

8.3 **German** 1995

Sprachdiplom II Passed
B2-C1

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. v19. p36

doi 10.1007/s11295-023-01610-0

9.2 The Cerrado (Brazil) plant cytogenetics database 2017

Roa, Fernando; Telles, Mariana Pires de Campos. Comparative Cytogenetics. v11. p285-297
Repo(s): gitlab cerradocytopu
Web-page: shinyapps.io

doi 10.3897/CompCytogen.11(2).11395

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. v146. p243-249

doi 10.1159/000440930

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

Roa, Fernando; Guerra, Marcelo. BMC Evolutionary Biology. v12. p225

doi 10.1186/1471-2148-12-225

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. v33. p731-738

doi 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. v280. p219-227

doi 10.1007/s00606-009-0184-6

10 Software: packages, scripts, pages

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

R package/ Shiny App

Repo(s): github invoice-public, CRAN shinyInvoice

Web-page: shinyapps.io

10.2 NLP for classifying community feedback

Python/R code; Shiny-App

Repo(s): gitlab nlpfeedback, github NLPShiny_rhino_mod

10.3 Cytogenetics characteristic evo modeling

Shiny-App

Repo(s): gitlab cytoevopri

Web-page: shinyapps.io

10.4 idiogramFISH: plot Idiograms and Karyotype indices

R-package; Shiny-App

Repo(s): gitlab idiogramFISH, CRAN idiogramFISH

Web-page: shinyapps.io

Docs: gitlab.io

10.5 Curriculum

Rmarkdown

Repo(s): gitlab curriculumpu

Web-page: gitlab.io

10.6 Reading databases

R Scripts

Repo(s): gitlab getdatabase

10.7 linkScraping: Creating a .bib library from journal html pages

Python/R scripts

Repo(s): gitlab linkscraping

11 Courses taught

11.1 Cytogenetics 2015.I

Level: Graduate 40h

Universidade Federal de Goiás. Language: portuguese

11.2 Cytogenetics 2014.I

Level: College 64h

Universidade Federal de Goiás. Language: portuguese

12 Talks in Events

12.1 NLP modularized app for classifying community feedback 25-04-2022

Appsilon 2022 meeting

Technologies: R, python, tensorflow, keras

online

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

70 Congresso Nacional de Botânica. Language: portuguese

Technologies: R, iqtree, revBayes, MAFFT, StableTraits

Maceió, AL, Brazil

12.3 Cytogenetics for resolving evolutionary questions 27-04-2018

Encontro da liga acadêmica de genética. Language: portuguese

Technologies: R, iqtree, MAFFT

UFG. Goiânia, Brasil

12.4 Reconstruction of ancestral states of cytogenetic characters in Leguminosae 20-10-2017

XI Workshop de Genética da PUC Goiás. Language: portuguese

Technologies: R, iqtree, revBayes, MAFFT, StableTraits

PUC. Goiânia, Brasil

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

Reunião de citogenética do Brasil Central. Language: portuguese

Technologies: R, mongoDB

PUC. Goiânia, Brasil

12.6 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

12.7 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

12.8 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

13 Abstracts in Annals

13.1 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

13.2 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

13.3 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. p: 53

13.4 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. p: 262

14 Courses and Workshops Taken

14.1 Mathematics for Data Science and Machine Learning using R 05 2024

udemy - Eduonix 10h

Theoretical and Practical Course

14.2 Git and Github Bootcamp 05 2023

udemy 17h

Theoretical and Practical Course

14.3 Data Science for All (ds4a) 20/05-10/09 2021

Correlation One 375h

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

14.4 Linux Course
23/01-24/02 2020

Geek University
Theoretical Course

14.5 Introducing python
28/07-09/08 2019

Universidade Federal de Goiás, Goiânia, Brasil
90h
Theoretical and Practical Course. Language: Portuguese

15 Personal references

15.1 Oriol Senan
Workplace: Appsilon

15.2 Michal Parkola
Workplace: Appsilon (previously)