



ESALQ

USP



# Experiences of the Brazilian Python Workshop for Biological Data in 2022

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30th Conference on  
INTELLIGENT SYSTEMS FOR MOLECULAR BIOLOGY  
DATES JULY 10-14, 2022

# Background

The first **Brazilian Python Workshop for Biological Data** was organized by **undergraduate and graduate students** in 2017.

Over the years, it has been supported by researchers in computational biology, data science, and life sciences.

Main purpose: to **improve training of life sciences researchers in Brazil**.

## Itinerant event

In person editions

São Paulo



2017

São Carlos



2018

2019

Virtual editions

Piracicaba



2020

Jaboticabal



2021

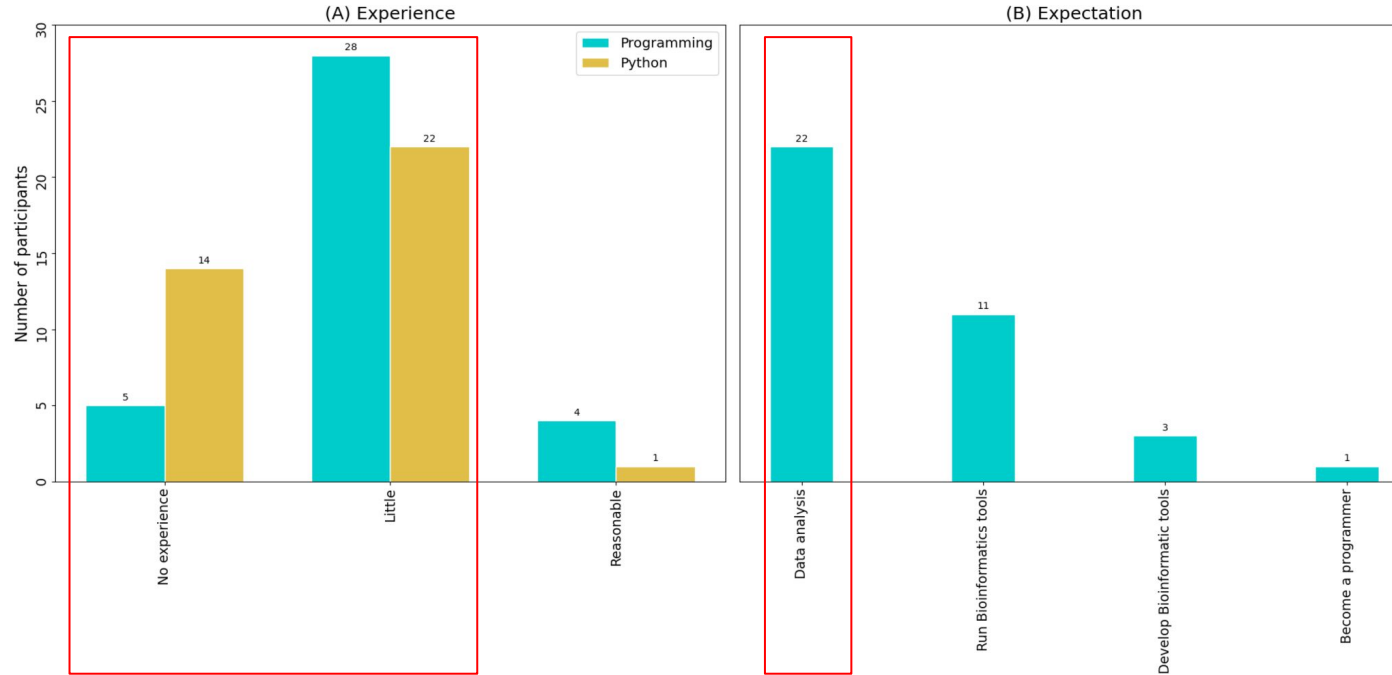
Piracicaba



2022

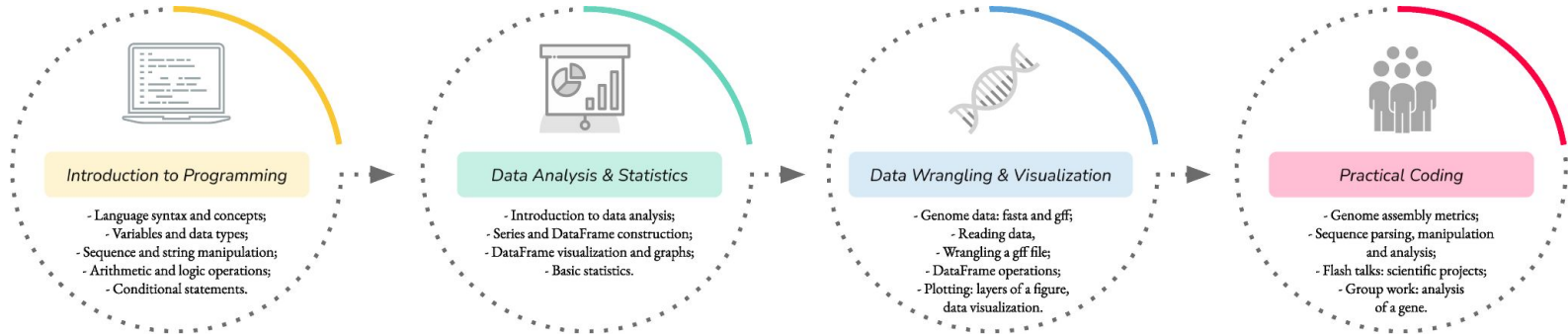


# Target audience

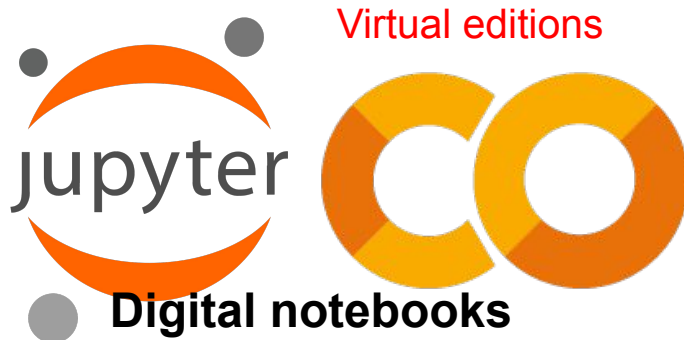


Active students are invited to become members of the organizing team of a subsequent edition.

# Workshop structure



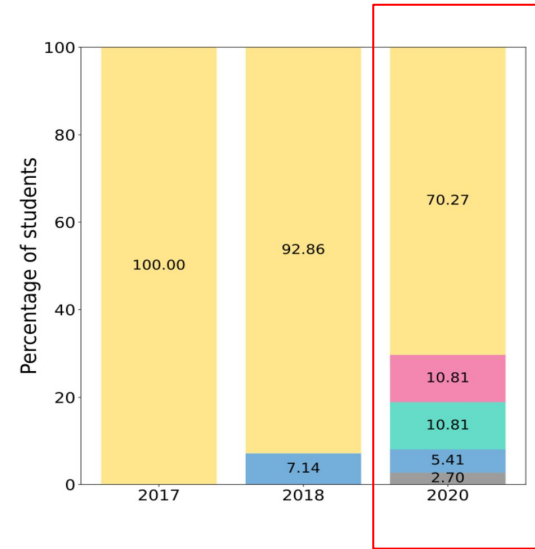
## Participatory live coding (4 - 5 days) in online platforms



Communication &  
Live coding



# Our workshop since the 2020 edition is more inclusive



Our website this year:  
<https://wpdb2022.netlify.app/>

## V Workshop Python para Dados Biológicos

Aplicação de Python na análise de dados biológicos!

Inscreva-se!



### Simulação Eco-Evolutiva em Python

Dr. Zander Augusto Spigoloni  
Vilaça

Universidade Federal de Goiás  
(UFG)

📅 Dia 1 - segunda (26/09/2022)

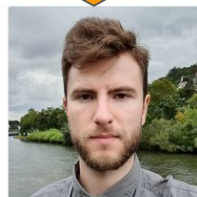


### Executando programas externos com a biblioteca subprocess

João Gabriel Rodinho Nunes  
Ferreira

Bio Bureau Biotecnologia - Rio de  
Janeiro, RJ

📅 Dia 2 - terça (27/09/22)



### Boas práticas de programação e reprodutibilidade de scripts Python

Me. Bruno Iochims Grisci

Universidade Federal do Rio Grande  
do Sul (UFRGS)

📅 Dia 4 - quinta (29/09/2022)



### O que é possível fazer sabendo o básico de python?

Beatriz Rodrigues Estevam

Escola Superior de Agricultura "Luiz  
de Queiroz" - ESALQ/USP e Centro  
de Energia Nuclear na Agricultura da  
Universidade de São Paulo -  
CENA/USP

📅 Dia 5 - sexta (30/09/22)



## Equipe



Claudia Barros Monteiro-  
Vitorello  
Professora Associada  
Universidade de São Paulo  
(USP-ESALQ)



Diego M. Riaño Pachón  
Professor Doutor  
Universidade de São Paulo  
(USP-São Paulo)



Gustavo Crestana  
Doutorando em Genética e  
Melhoramento de Plantas



Larissa Graciano Braga  
Doutoranda em Ciência  
Animal



Leonardo Mumbach  
Mestrando em Manejo e  
Conservação de Vida Silvestre  
Universidade do Vale do Rio  
dos Sinos (UNISINOS)



Matheus Scaketti  
Mestrando em Genética e  
Biologia Molecular  
Universidade Estadual de  
Campinas (UNICAMP)



Raissa Melo de Sousa  
Doutoranda em Genética e  
Biologia Molecular  
Universidade Federal do Para  
(UFPA)



Renato Augusto Corrêa dos  
Santos  
Doutor em Genética e Biologia  
Molecular



Ricardo Cerri  
Professor Doutor em Ciência  
da Computação  
Universidade Federal de São  
Carlos (UFSCar)



Rodolfo Bizarria Jr.  
Doutorando em Microbiologia  
Aplicada  
Universidade Estadual Paulista  
(UNESP-Rio Claro)



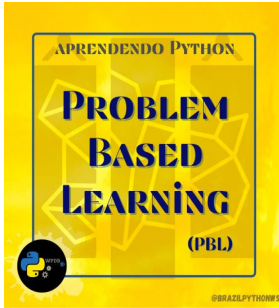
Ubiratan Batista  
Graduando em Ciências  
Biológicas  
Universidade Federal de Ouro  
Preto  
(UFOP)



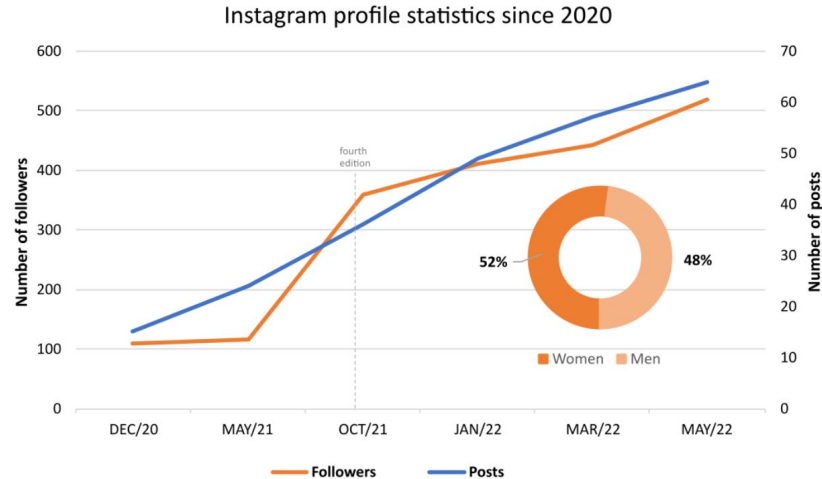
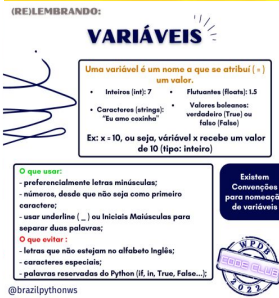
Vinicius Franceschini-Santos  
Bacharel em Ciências  
Biológicas  
Universidade de São Paulo  
(USP-Ribeirão Preto)

## Reproducibility

# Using social media to increase our social impact



Increase in activity on Instagram  
(mainly) and on Twitter since 2020



# Train the Trainers - like short event

Since 2021, we have implemented a short event inspired by the Train the Trainers from EMBL-EBI and Australian universities, that **aims to encourage the exchange of experiences between previous and the current organization committee.**

This year, we also invited **former students** to attend the TtT event.



# Organizing code clubs to engage and empower the team

Starting in **2022** to help the team become familiar with Python and with teaching practice.

**Connected** with workshop content and provide material for social media  
(‘reach of publication’ measures **diffusion** and **social impact**)



Fortn.	Title	Description	Social Media	*Previous workshop content
1 and 2	Variable and operators <sup>1,2</sup>	Arithmetic, assignment comparison and logical operators	147/138	Box 1/First day
3	Strings <sup>1,2</sup>	Indexing, methods and functions applied to strings	257	Box 1/First day
4	Sequences <sup>1,2</sup>	Tuples, lists, ranges	186	Box 1/First day
5	Control Flow, Statements <sup>1,2</sup>	if, elif, and else	144	Box 1/First day
6	Sets <sup>1,2</sup>	Structure, methods and functions applied to Sets	169	Box 1/First day
7	Control Structures Repetition <sup>2</sup>	for and while	-	Box 1/Second day

Fortn.	Title	Description	Social Media	*Previous workshop content
8	Dictionaries <sup>2</sup>	Structure, methods and functions applied to Dictionaries	-	Box 1/Second day
9	Functions and Recursion <sup>2</sup>	Function definition, structure	-	-
10	Numpy <sup>2</sup>	Arrays structure, vector and matrix operations	-	-
11, 12 and 13	Pandas <sup>2</sup>	Series, Dataframe, and data manipulation	-	Box 1/ Second and Third day
14	Data cleaning <sup>2</sup>	Cleaning and treatment of biological data sets	-	Box 1/Third day
15	Matplotlib <sup>2</sup>	Data visualization	-	Box 1/Third day
16	Biopython <sup>3</sup>	Manipulating sequence data	-	Box 1/Fourth day

# Encouraging collaborative construction of research project using Python

We have approval from Human Research Ethics Committee to do qualitative research during and after the workshop this year again.

Question Type	Data Type		Used Library	Graphic Output
Objective	Qualitative	Nominal	Basic Python Functions/ Matplotlib	Donut/ Bar Chart
		Ordinal		
Discursive	Qualitative	Ordinal		Stacked Bar Char

This year we will allow **donations from attendees**, to benefit third-party organization(s) targeting **inclusion, diversity, and programming in science** (it may also be spent in publication fees).



# Thank you!

## Reference

Zuwanov, et al. "The experience of teaching introductory programming skills to bioscientists in Brazil." PLoS computational biology 17.11 (2021): e1009534.



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