

# Implementation and Practice of Teaching Statistical Consulting in Brazil

Our experience in teaching statistical consulting in an undergraduate Statistics course

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Federal University of Rio Grande do Norte

# Introduction

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- This presentation will show how Statistical Consulting was introduced as a core part in the undergraduate Statistics curriculum at Federal University of Rio Grande do Norte
- We will present its main features and some results we got so far
- It is one of the efforts we made to modernize our curriculum, improve retention, and enhance the academic journey of the students

# Team

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# Team



Andressa Siroky



Antonio Nascimento



Carla Vivacqua



Eliardo Guimarães

# Team



Hermes Marques



Luz Fernández



Mariana Araújo



Talita Barros

# Motivation

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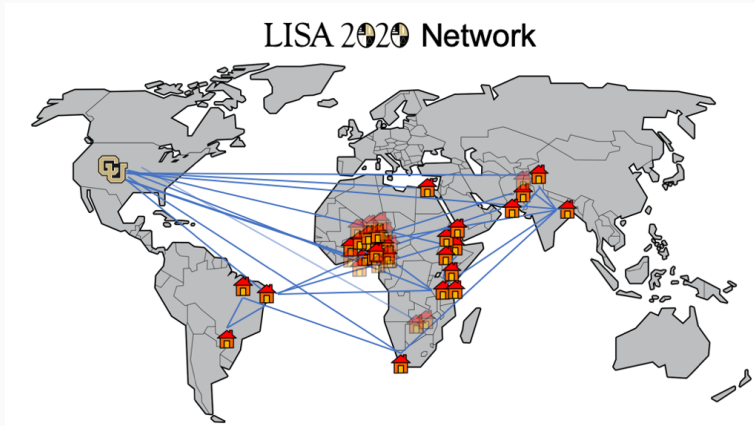
- Meet the Education Ministry demands
- Lower the evasion
- Ease the course flow



# Structure

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- Applied Statistical Lab
- Created in 1978, reformulated in 2012
- Used as a link between Department of Statistics and other departments or universities
- Part of LISA 2020 - <https://lisa2020.org>, a global network of statistical consulting and data science labs in developing countries



# General Structure

- Statistical consulting is a mandatory 3-year (6-semester) track in our B.Sc.
- Ideally, the students should start it at their 2nd year
- For the most part, the 1st year of the track follows a regular lecture structure
- The 2nd and 3rd years are project-oriented where the students work together with at least one advisor

## Statistical Consulting Track

B.Sc.

1st Year

2nd Year

3rd Year

4th Year

Lectures

EST0151

EST0152

EST0153

Project-  
Oriented

EST0154

EST0155

EST0156

## Structure - 2nd Year

- **EST0151** – Statistical Consulting I – Communication (30 hours)
  - Pre-requisites: None
- **EST0152** – Statistical Consulting II – Exploratory Data Analysis (30 hours)
  - Pre-requisites: Descriptive Statistics and Statistical Consulting I – Communication

- **EST0153** – Statistical Consulting III – Junior Consulting (30 hours)
  - Pre-requisites: Statistical Methods and Statistical Consulting II – Exploratory Data Analysis
- **EST0154** – Statistical Consulting IV – Junior Consulting (30 hours)
  - Pre-requisites: Statistical Consulting III – Junior Consulting

- **EST0155** – Statistical Consulting V – Senior Consulting (60 hours)
  - Pre-requisites: Statistical Consulting IV – Junior Consulting
- **EST0156** – Statistical Consulting VI – Senior Consulting (60 hours)
  - Pre-requisites: Statistical Consulting V – Senior Consulting

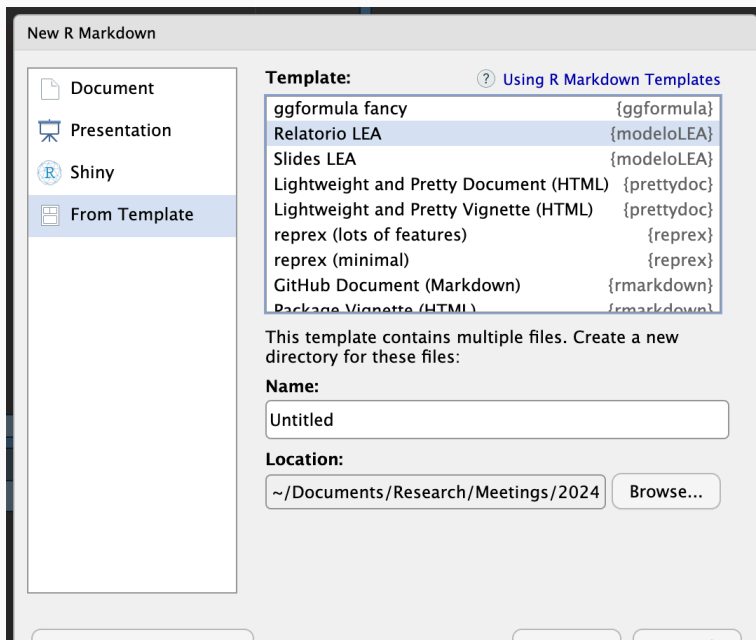


# Syllabus

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- Communication (Zahn, 2009)
- POWER method:
  - Prepare
  - Open
  - Work
  - End
  - Reflect

- Use of R Markdown as the tool for report writing
- It mixes R code and regular text to create reports and presentations
- The author can focus only on content, without concerns about the report format
- The analysis can be audited by the advisor



```
1 ---
2 title: Relação Entre Velocidade e Distância de Frenagem para Carros de Passeio
3
4 # use letras para afiliacao
5 author:
6   - name: Aluno Consultor
7     affiliation: a,b
8   - name: Consulente
9     affiliation: c,d
10  - name: Marcus A. Nunes
11    affiliation: a,e
12 address:
13   - code: a
14     address: Departamento de Estatística - UFRN
15   - code: b
16     address: Consultor
17   - code: c
18     address: Outro Departamento - UFRN
19   - code: d
20     address: Consulente
21   - code: e
22     address: Orientação
```



## Relatório de Consultoria

### Áreas do Conhecimento:

engenharia mecânica, projetos de máquinas

### Palavras-Chave:

regressão linear, automobilismo, segurança, trânsito

## Relação Entre Velocidade e Distância de Frenagem para Carros de Passeio

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Aluno Consultor<sup>a,b</sup>, Consulente<sup>c,d</sup>, Marcus

A. Nunes<sup>a,e</sup>

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<sup>a</sup>Departamento de Estatística - UFRN

<sup>b</sup>Consultor

<sup>c</sup>Outro Departamento - UFRN

<sup>d</sup>Consulente

<sup>e</sup>Orientação

Este trabalho estuda a relação entre a velocidade de carros (mph) e a distância (pés) que eles levaram para parar completamente. Utilizamos o modelo de regressão linear simples para determinar se existe relação entre estas duas variáveis.

- Exploratory Data Analysis in R
- `tidyverse`
- Written reports in R Markdown

- Short-time collaborations
- Real-life projects according to the students experience
- (Almost) Anything goes: from descriptive statistics to ordinal generalized linear models



# Analysis

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- 14 out of 22 enrolled students from EST0151 in 2024 answered a survey
- There were open- and closed-ended questions
- We show a preview of our future paper, with the analysis of two open-ended questions

What did you like most about the course?

A word cloud visualization of feedback from students. The words are arranged in a circular pattern, with the most frequent or prominent words in the center and larger font sizes. The words include:

- consultoria
- aula
- reunião
- alunos
- experiências
- consulentes
- sala
- assistir
- comunicação
- reais
- apresentações
- reuniões
- forma

What did you like least about the course?

nada  
1 consultoria  
alunos

atividades

3 grupos

## Final Remarks

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# Final Remarks

- Teaching statistical consulting has provided insights into both pedagogy and practical application
- Students developed their communication, teamwork, and problem-solving abilities
- There was more student engagement with the projects
- We need to engage more the students from different semesters

# References

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# References

1. Zhan, D. (2009) The Heart of a Statistician Career: Relationships and Interaction. *Amstat News*, September 2009.