# VE401 SU2022 RC: introduction

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# Outline

# Introduction to ...

- Instructor

# Introduction to ...

- Instructor
- Me

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- Instructor
- Me
- Course Content

# Instructor

Horst Hohberger

- Teaching Professor at JI(2021-)
- Join JI since 2007
- Personal Website: https://umji.sjtu.edu.cn/~horst/index.html
    - The course slide and sample assignments are available here(but isn't the assignment this year)

# Self Introduction

Shuyu Wu

- work experience at JI
  - TA in VG101 FA21(2021.9-2021.12)
  - Honor Council Member(2021.11-)
- the programming language I like for this course
  - Matlab
  - Python(with scipy)
  - ~~Mathematica~~(but it's the official language for this course)

# About this course, VE401

Three main parts

- probability theory
- introduction to statistics
- analysis of linear regression and analysis of variance

We don't teach

- random process
- Bayesian analysis in statistical inference

But there may be extra topics in my RC related to these topics

# About this course, VE401

- What's "probability" and "statistics" based on the probability and statistics knowledge you have learnt in your life?

- Is there a mathematical definition for "probability"?

- What's the purpose of statistics? How can it help us understand and transform the world?

- Is statistics theory belongs to mathematics? Why?

# Example

- In physics lab, we calcuate type-A uncerteainty by calcuating the sample deviation $S$, and use formula $t_{n-1}\frac{S}{\sqrt{n}}$. Have you ever thought what's the principle behind the formula?(~~I know you haven't. This course is so annoying.~~ But now you have survived this course and let's revisit these contents again).

- In COVID-19 Hong Kong epidemic(2022 Feb-April), research has shown that the death rate for people who don't get vaccined is 2.87%, while 0.14% for fully vaccined(2 doses) and 0.03% for boosted. Does that really show vaccine is so powerful?

- In USA, before general election, there'll be polls. However, for many times we can find that the result is different from polls. What factors may contribute to the difference?

# RC Plan

My recitation class will contain these parts:

- review of concepts
- exercise
- subjective view on some ideas
- extra topics and experiments(computer simulation)

# Extra Topics

Extra topics may include, but not limited to,

- history of some famous mathematicians or concepts
- introduction to random process
- game theory and gambling
- some python package
- related algorithms

# Concept Checking Paper

Weekly concept revision. Initiated by previous VV186, 285, 286TA Leyang Zhang. Also used in VE203 SP2022.

Every week I'll post next week's concept checking paper. I may not release all the materials altogether at the beginning of the semester.

# About Programming in this Course

Official language: Mathematica

- powerful in mathematic calculation(like integral)
- it's not usual "program", it's notebook
- may be in a mess if you don't use it properly
- alternative: python, matlab, R, SPSS(if you happen to know how to use it)

Python

- open source libraries
- for this course: numpy, scipy, pandas
- jupyter notebook

Matlab

- commercial software which you're familar with
- very powerful in mathematic modeling, hypothesis testing and linear regresson analysis

# Other comments for this course

- Actually much "easier" than VV186, 285, 286 in terms of the abstraction of concepts.

- Warning! If you think this course only consists of applying formula and using softwares, it will come at a cost of your grade. You need to understand the principle behind the concepts.

- Contain many group works. Don't violate HC otherwise the whole team may be reported to honor council together.

- Also, any grade issues need to be raised within 2 weeks, otherwise they'll be automatically rejected. "Legitimate concerns regarding grade-relevant scores communicated in a timely fashion, will of course always be treated in an objective manner. On the other hand, 'hunting for points' in old assignments just so that a few tenths of a percentage point can lead to a jump into the next higher letter grade scale is not acceptable. "