

VE401 SU2022 RC: introduction

Shuyu Wu

UM-SJTU Joint Institute



JOINT INSTITUTE
交大密西根学院

wushuyu2002@sjtu.edu.cn

May 14, 2022

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Introduction to ...

- Instructor

Introduction to ...

- Instructor
- Me

Introduction to ...

- 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)
- The new website for this course:
<https://ece401.ji.sjtu.edu.cn/index.html>

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 (ANOVA, may not be taught this semester)

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 calculate type-A uncertainty by calculating 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 vaccinated is 2.87%, while 0.14% for fully vaccinated(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 Layang 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 familiar with
- very powerful in mathematic modeling, hypothesis testing and linear regression 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. ”