

Mathematical Statistics

MH7004

Introduction

This lecture

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Background

- **Since 09.2024:** Tenured Associate Professor at NTU
- **01.2019-08.2024:** Nanyang Assistant Professor at NTU
- **06.2015-12.2018:** Postdoc in Financial and Insurance Mathematics at ETH Zurich
- **02.2012-05.2015:** PhD in Mathematics, ETH Zurich (Columbia U.)
Supervisors: Prof. Marcel Nutz (Columbia University),
Prof. Martin Schweizer (ETH Zurich)
Thesis title: Knightian Uncertainty in Mathematical Finance
- **10.2006-10.2011:** Bachelor and Master in Mathematics at ETH

Research interests:

- Machine Learning Algorithms in Finance and Insurance
- Model Uncertainty in Financial Markets
- Financial and Insurance Mathematics
- Stochastic Analysis & Stochastic Optimal Control
- Stochastic Optimization and Applied Probability Theory

Who are you?

Who are you?

Schedule

- ① **Lecture:** Friday 13:30-17:20 at MAS Exec Room 1

Teaching method

- ① We shall have a lecture followed by a tutorial
- ② No designated tutorials
- ③ Many examples throughout the lectures
- ④ No homework assignments, only recommended exercises

Learning subjects

- Part 0: Introduction
- Part I: Descriptive statistics
- Part II: Elements of Probability
- Part III: Random variables
- Part IV: Confidence interval
- Part V: Point Estimation
- Part VI: Maximum Likelihood Estimation
- Part VII: Bayesian Inference
- Part VIII: Hypothesis Testing
- Part IX: Regression
- Revision

Learning outcomes

Upon successful completion of the requirements for this course, students should have the knowledge and skills to:

- ① Demonstrate an understanding of probability theory
- ② Demonstrate knowledge of, and properties of, statistical models in common use
- ③ Understand the basic principles underlying statistical inference (estimation and hypothesis testing)
- ④ Be able to construct tests and estimators, and derive their properties
- ⑤ Understand the difference between Frequentist and Bayesian approaches

Learning resources

- ① **Slides** will be available online via NTULearn and my homepage
- ② **Book:** Statistical Inference, 2nd Ed,
by George Casella and Roger L. Berger, 2001
(You can find it using google)
- ③ **Consult** and **discuss** with your class mates
- ④ My **email** address: ariel.neufeld@ntu.edu.sg

Semester Dates

2026

		JANUARY					FEBRUARY					MARCH									
		S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F
									1	2	3					1	2	3	4	5	6
		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Teaching Weeks	1	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	2	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13
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Indicative assessment

- ① Individual Oral Exam (30 minutes each)

Date: T.B.A.

Questions

Questions?