Biomedical Engineering Degree

Inference

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Course information

Felipe Alonso Atienza, course coordinator (felipe.alonso@urjc.es)

- Location: D121 (*Gestión* Building, Fuenlabrada)
- Senior Expert Data Scientist at BBVA
- Part time Associate Professor at URJC
- Dept. Signal Theory and Communications
- Google scholar profile
- GitHub repository: course materials
- LinkedIn profile
- @FelipeURJC
- Consultation: appointment upon request, from @alumnos.urjc.es

Schedule: Teams Meeting

- *Location: Alcorcón campus*
- Wednesdays: from 17 to 19 pm

Aim and motivating examples

Statistical inference is the process of generating conclusions about a population from noisy data that was drawn from it. Brian Caffo.

1. Weather prediction: using historical data to predict tomorrow's weather, so it can stated that *"the probability that it will rain tomorrow is 70 %"*.
2. Causal questions: *"Does smoking cause cancer?"*
3. Credit risk analysis: determine the most significant variable to predict the risk of default.
4. A/B testing: is a way to compare two versions of a single variable, typically by testing a subject's response to variant A against variant B, and determining which of the two variants is more effective

Assumed knowledge: prerequisites

Probability and Statistics, Calculus

Contents

Tentative schedule 20/21

	Feb 2021					
		L	M	X	J	V
1	8-feb			**P**		
2	15-feb			**U1**		
3	22-feb			**U1**		

	March 2021					
		L	M	X	J	V
4	1-mar			**U2**		
5	8-mar			**U2**		
6	15-mar			**U3**		
7	22-mar			**U3**		
	29-mar					

Vacations

Partial examination

P presentation

Ux Unit x

P1 Partial 1 (14/04/2021)

P2 Partial 2 (03/06/2021)

	April 2021					
		L	M	X	J	V
8	5-abr			**U4**		
9	12-abr			**P1**		
10	19-abr			**U5**		
11	26-abr			**U5**		

	May 2021					
		L	M	X	J	V
12	3-may			**U6**		
13	10-may			**U7**		
14	17-may					
	24-may					
	31-may				**P2**	

Assessment

$2 \times 35\,\%$: term exams

- Theoretical and practical problems and concepts (test and short answers)

$30\,\%$: Final project using PYTHON

- Practical lessons throughout the course.

You pass the course if

$$0.35 \times \text{Examen } 1 + 0.35 \times \text{Examen } 2 + 0.3 \times \text{Project} \geq 5.0$$

Books and references

1. R. Bernard. *Fundamentals of Biostatistics*. Ed.: Thompson
2. D. Díez, M Cetinkaya-Rundel and CD Barr. *OpenIntro Statistics*.
3. B. Caffo. *Statistical Inference for Data Science*. Leanpub
4. B. Efron and T. Hastie. *Computer Age Statistical Inference*.