Biomedical Engineering Degree

Inference

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Course information

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

- Location: to be defined (TBD)
- 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: room L106, Lab. I

- Location: Alcorcón campus
- Thursdays: from 19 to 20 pm
- Fridays: from 15 to 16 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 19/20

Jan 2020						
		L	M	X	J	V
1	20-ene				**P**	**T0**
2	27-ene				**T1**	**T1**

Feb 2020						
		L	M	X	J	V
3	3-feb				**T1**	**T2**
4	10-feb				**T2**	**T2**
5	17-feb				**T3**	**T3**
6	24-feb				**T3**	**T3**

Vacations
Exam

March 2020						
		L	M	X	J	V
7	2-mar				**T4**	**Ex**
8	9-mar				**T4**	**T4**
9	16-mar				**T5**	**T5**
10	23-mar				**T5**	**T5**
11	30-mar				**T6**	**T6**

April 2020						
		L	M	X	J	V
12	6-abr					
13	13-abr				**T7**	**T7**
14	20-abr				**T7**	**T7**
15	27-abr				**Ex**	

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. Casella, G. y Berger, R. L. *Statistical Inference*. Wadsworth and brooks.
3. William M. Bolstad and James M. Curran. *Introduction to Bayesian Statistics*. Third Edition, Wiley, 2016.
4. Python resources: www.python.org.