

Optimization

Màster de Fonaments de Ciència de Dades

Gerard Gómez & Lluís Garrido

Calendar

September							October						
Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su
												1	2
							3	4	5	6	7	8	9
12	13	14	15	16	17	18	10	11	12	13	14	15	16
19	20	21	22	23	24	25	17	18	19	20	21	22	23
26	27	28	29	30			24	25	26	27	28	29	30
							31						
November							December						
Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su
	1	2	3	4	5	6				1	2	3	4
7	8	9	10	11	12	13	5	6	7	8	9	10	11
14	15	16	17	18	19	20	12	13	14	15	16	17	18
21	22	23	24	25	26	27	19	20	21	22	23		
28	29	30											

In **red** lectures (14), in **blue** exercises and projects (13)

Mondays 17:00–19:00 and Tuesdays 17:00–19:00

Presentation of the course

Contents

- I Unconstrained optimization and optimality conditions
- II Gradient methods for unconstrained optimization
- III Newton and Gauss-Newton methods
- IV Convexity
- V Constrained optimization. Lagrange multipliers
- VI Duality
- VII Interior point methods
- VIII Penalty methods
- IX Stochastic optimization

References

1. Sèbastien Bubeck: *Convex Optimization: Algorithms and Complexity*. Now Publishers Inc., 2015
2. Mordecai Avriel: *Nonlinear Programming*. Prentice-Hall, Inc., 1976.
3. Dimitri P. Bertsekas: *Nonlinear Programming*. Athena Scientific, 2003.
4. Stephen Boyd, Lieven Vandenberghe: *Convex Optimization*. Cambridge University Press, 2004.

Evaluation of the course

- ▶ 50% laboratory projects
- ▶ 30% exercises
- ▶ 20% final exam