

July 7th, 2017

IFAE 25th Anniversary Celebration

CAREERS BEYOND IFAE

Vicens Gaitan



1990 -1994:
PhD Student at IFAE
ALEPH Experiment



1994-Today:
Chief Scientist Grupo AIA 

*“Neural Networks are the *second* best way to solve a problem”*

July 7th, 2017

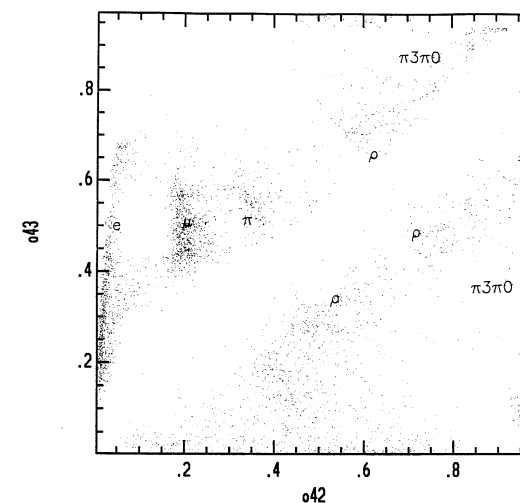
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CAREERS BEYOND IFAE

◀ At IFAE...

- Neural Networks methodologies in HEP
 - Event selection
 - Track reconstruction
 - Non supervised data analysis
- Simultaneous measurement of τ Branching ratios and polarization at LEP (ALEPH)
- First try to introduce machine learning in HEP data analysis. In the 90's, there was not so many followers, but today things are changing...

5.4 Unsupervised τ classification

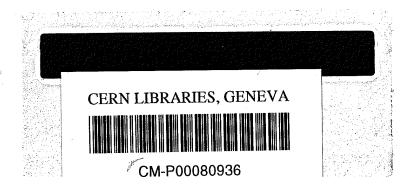


Input neuron	Variable Description	Kolmogorov C.L.
1	Number of charged tracks in hemisphere +	0.947
2	Number of charged tracks in hemisphere -	0.339
3	Number of neutral tracks in hemisphere +	0.010
4	Number of neutral tracks in hemisphere -	0.047
5	Total charged energy in hemisphere +	0.131
6	Total charged energy in hemisphere -	0.078
7	Total neutral energy in hemisphere +	0.874
8	Total neutral energy in hemisphere -	0.995
9	Number of identified μ in hemisphere +	1.000
10	Number of identified μ in hemisphere -	1.000
11	Number of identified electrons in hemisphere +	0.367
12	Number of identified electrons in hemisphere -	0.921
13	Number of identified γ in hemisphere +	0.258
14	Number of identified γ in hemisphere -	0.746
15	Planarity	0.489
16	Total momentum in hemisphere +	0.523
17	Total momentum in hemisphere -	0.534
18	Invariant mass	0.90621
-	Output neuron	0.457

Neural Networks in High Energy Physics:
From Pattern Recognition to Exploratory
Data Analysis ¹

Vicens Gaitan Alcalde
Universitat Autònoma de Barcelona
Institut de Física d'Altes Energies
E-08193 Bellaterra (Barcelona) Spain

November 1993



Thesis-1993-Alcalde

¹Thesis Dissertation

July 7th, 2017

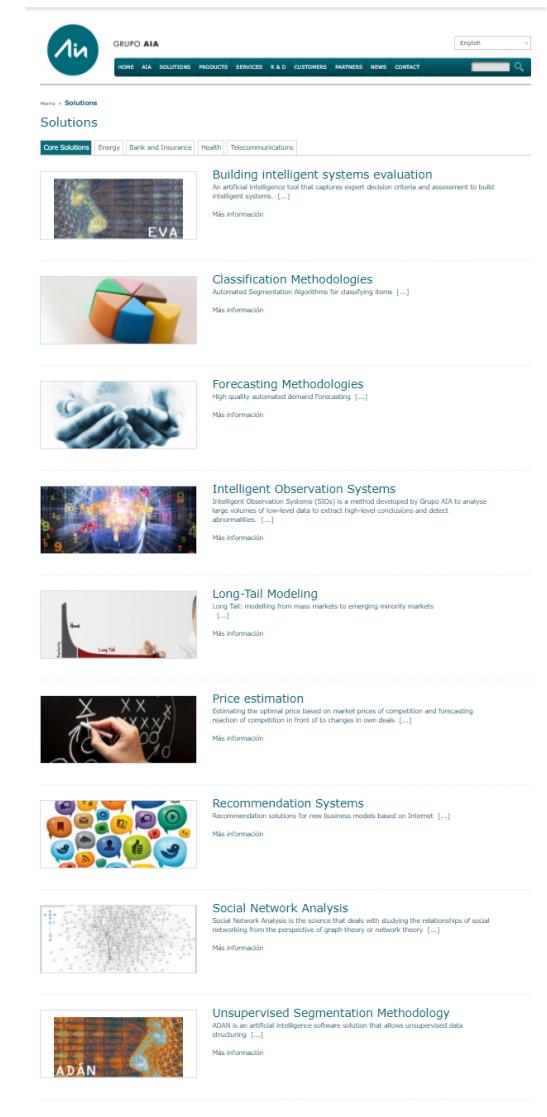
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CAREERS BEYOND IFAE

►► Now...

- Chief scientist at Grupo AIA
- Managing a team of 20 data scientists working in Energy, Banking, Telecom and Retail projects for big companies worldwide.
- Using State of the art technologies in Machine Learning for
Anomaly detection (fraud, anti-money laundering...)
Predictive analytic models
Forecasting
- Project with NASA for unattended control for power networks in spaceships

Algorithms
for a better
World

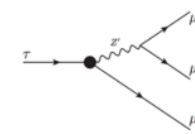


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CAREERS BEYOND IFAE

- Just for fun... but closing the loop



Completed • \$15,000 • 673 teams

Flavours of Physics: Finding $\tau \rightarrow \mu\mu$

Mon 20 Jul 2015 – Mon 12 Oct 2015 (4 months ago)

Kaggle profile for Vicens Gaitan. The profile shows a user who joined 3 years ago and is active. It includes a 'Competitions Master' badge and a list of recent competitions.

Competition	Rank	Score
TalkingData Mobile User D...	10 th of 1689	10
Prudential Life Insurance A...	12 th of 2619	12
Flavours of Physics: Findin...	15 th of 673	15



Competitive Data Science:
Physics Price at Kaggle
challenge Flavours of Physics

