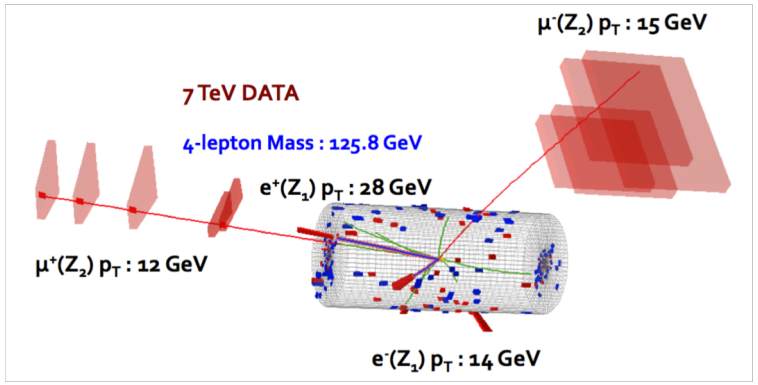
LHC career networking event

Marco Meneghelli

MM - experience

Physicist



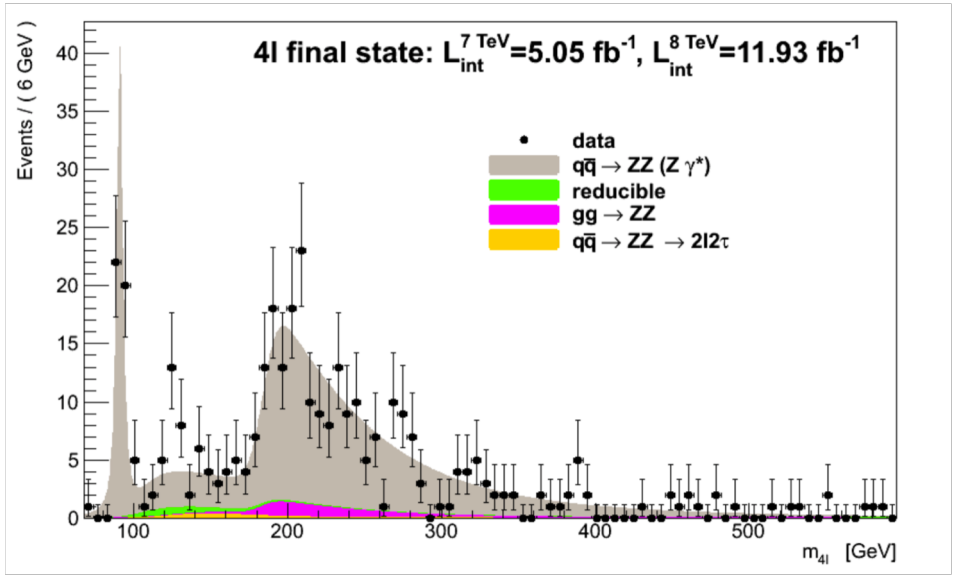
PhD student at CMS (Bologna and Geneva):

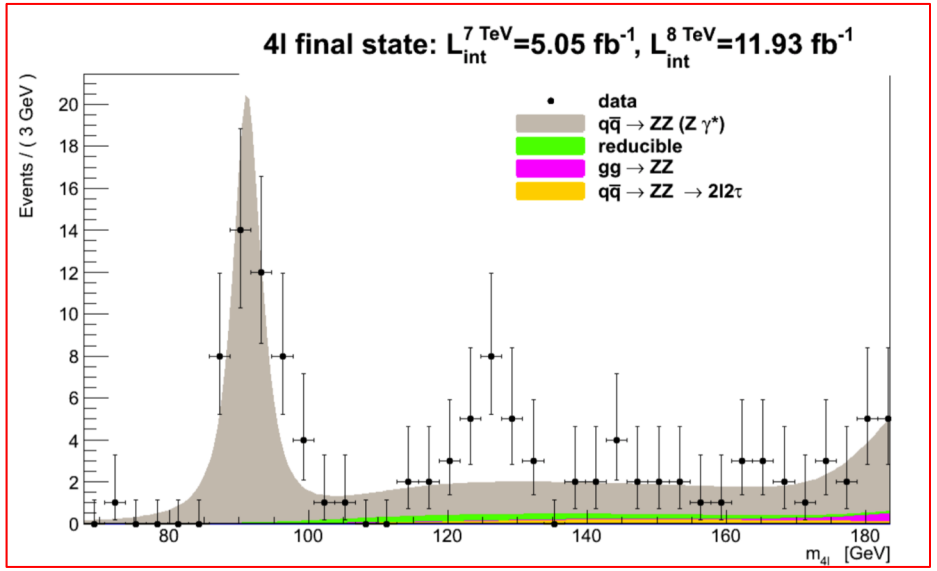
- *Physics*: search for the Higgs boson in the 4-lepton channel
- *Service*: Drift Tube detectors, responsible for the local trigger system and its software

Overall very positive experience

Pluses: did cutting-edge research, experienced high valuable and untrivial topics: e.g. complex hypotheses testing, look elsewhere effect. Worked with some very smart senior colleagues.

Minuses: prehistoric software technology. Closed world, auto-referential attitude.





Quantitative Analyst

Investment Bank in Milan

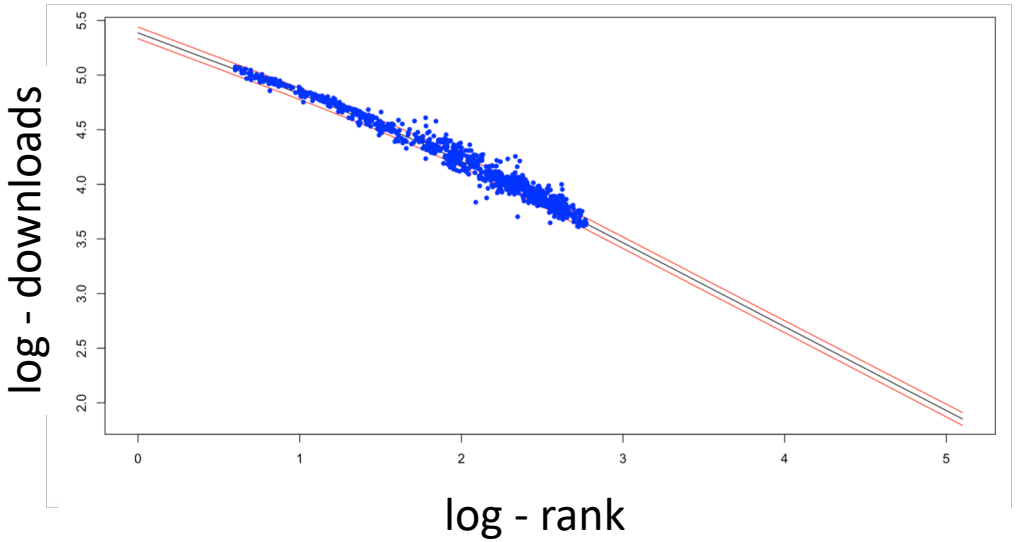
- *Analyst*: worked on trading strategies, data analysis and quantitative modeling of financial markets
- *Technology*: databases management, environment set-up and configuration, tools for data analysis and processing

Overall negative experience

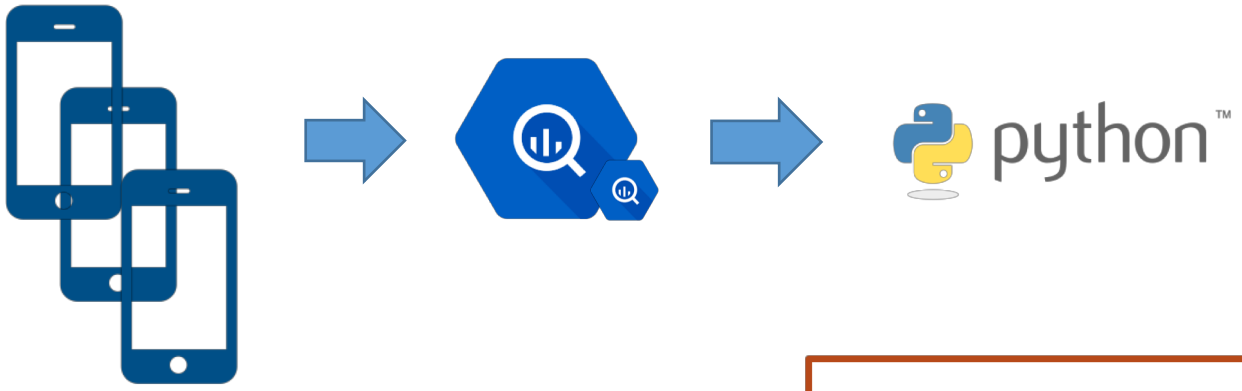
Pluses: know state-of-art software and tools. Learned interesting stuff about finance. Worked with some smart people.
Minuses: slow, inefficient, established company with no meritocracy nor career opportunities. Not many smart colleagues. Terrible management.

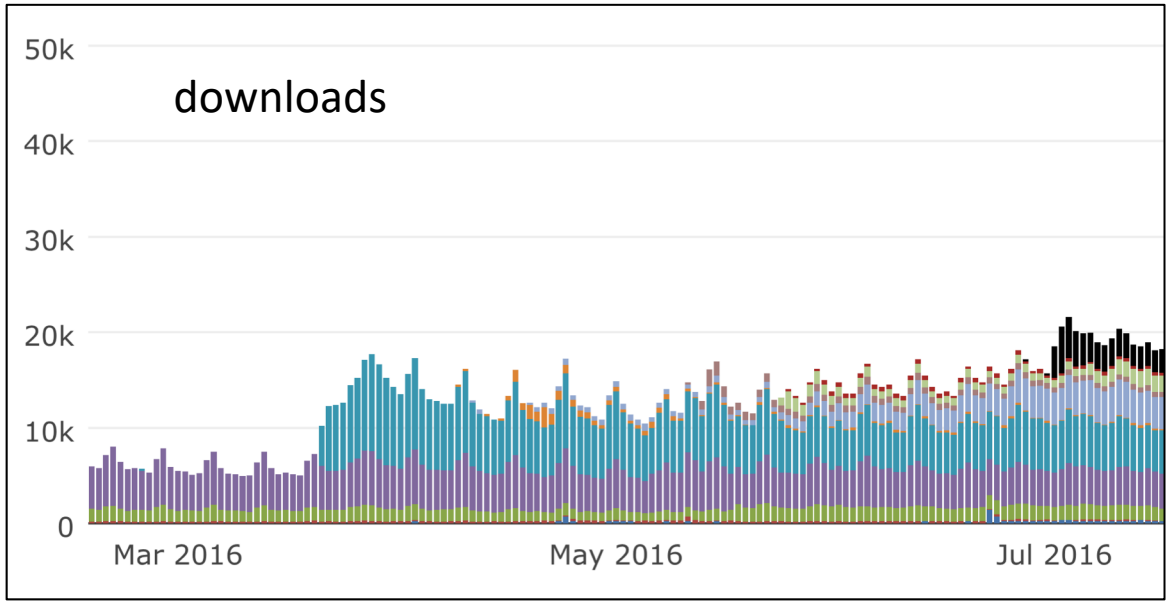
Data Scientist

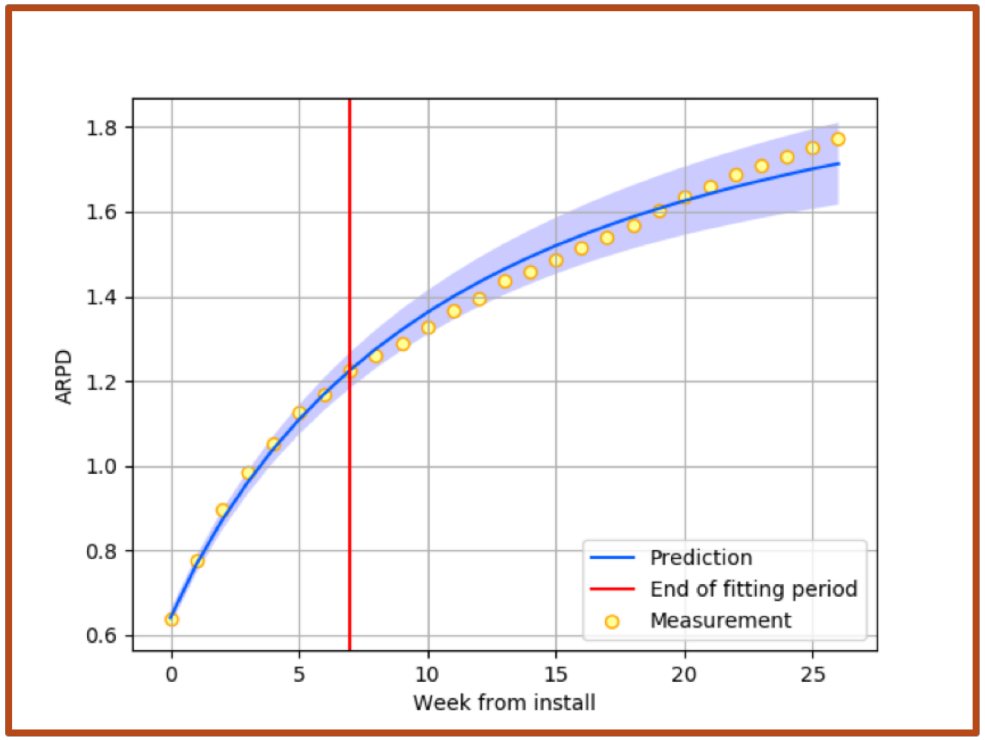
- *Analysis*: big-data analysis for mobile apps and quantitative modeling of costumer behavior in a freemium business case. Measurement and modeling of apps main metrics as Costumer Lifetime Value. A/B testing and optimization of apps and their metadata. User segmentation and valuation.
  Study of the market.
- *Technology*: development of proprietary tools to collect and manage data and to serve results.

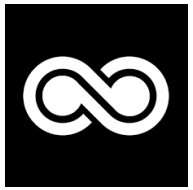


Data Scientist









Data Scientist

Overall very positive experience

Pluses: Built a data science team from scratch. Saw a company evolve from a startup to a medium size company (~200 employees). Doing cutting-edge research and analyses, with dramatic impact on business. Working with very smart colleagues. Working in a very nice environment.

Minuses: lack of senior colleagues (for me). Moving from being a startup into a big company can be uneasy, as doing things becomes less agile.

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Similarities/Differences

- Similarities:
  - **Doing research**: need to build predictive models based on some observed data and hypotheses, and able to predict future ones
  - **Modus operandi**: scientific method: study the state-of-art, formulate hypotheses, build and test models, validate them over new data
  - **Tools**: programming, technologies and analysis tools
  - Working with deadlines and periodic meetings, going to conferences…
- Differences:
  - **Time variability of "discoveries"**: what you "discover" in business is not a law of nature, but rather a pattern/model that might disappear/change in the future. You need to be smart to spot boundaries of applicability, and take advantage of it as it last.
  - **Practical applications**: what you do in business is often immediately usable for practical reasons. In research the practical applications of what you've done is something that, if happens, takes typically a lot of time. No focus on publishing and/or conferencing.
  - **Collaboration size**: now you are in a huge experiment. What you do is part of a huge machine, and every study is cross-checked by tens of peers. You'll most probably find yourself in a small team out there.

Pros/Cons (of business)

- Pros
  - Possibility of **making the difference:** satisfaction in seeing what you've done becoming **useful and applied immediately.**
  - Possibility to **work on several topics and to learn a lot of things**, rather than super-specializing in a few channels.
  - **Career opportunities**.
  - Work in a **competitive market**, rather than in a monopolistic field. This forces you to stay up to date.
- Cons
  - Possibly need to stop some interesting studies that would require time, **work on bounded-size projects**
  - Possibly **lack of cross check** and peer review on works that would need them. Sometimes **do rough approximations** for the sake of closing a project.
  - Possibility to learn from **very senior colleagues** was higher at CMS

My two cents

Disclaimer, what I look for in a career is:
- do interesting/challenging stuff, avoid boring stuff
- work with smart people and grow in knowledge/skills
- impact: I wan to see results and applications of what I do

View and advices – maximizing you chances

- **Stay simple on the first, broad phase**. At the beginning you'll most probably face a recruiter: this means few, if any, technical skills in your field. Stay high-level when you discuss your experience. Make it comprehensible to people non-technical. Name the largely known stuff when you list your skills (e.g. yes python, Machine Learning.. no Kalman-Filter algorithm for track reconstruction).
- Don't send a 5 pages academic CV!
- Do not assume your interviewer is more skilled/knowledgeable than you.
- Go deep in technical aspects only when you realize the other person can appreciate it.
- Consider taking an online python course or similar. Programming at CERN is archaic.

View and advices – choosing/judging the Job

- There are not many good companies out there. There is plenty of mediocre ones.
  - *look-up for*: innovative/open mindset, smart colleagues, opportunities. Companies that value people.
  - *avoid*: repetitive/boring/trivial stuff. Big, established companies, that haven't grown in recent times.
- **Interview is crucial**. The interview is two sided: you judge your interview and interviewer too. **Interview must be tough**, otherwise, with an easy one, I'll find yourself working with people of the level needed to pass it.
  - In the more technical phase of the interview, judge what you're being asked.
    - E.g.: "what is a linear regression" is a trivial question. "How model uncertainty change when data are correlated" is more interesting.
    - Try to understand what's the level of your technical interviewer. He's going to be the senior profile you are supposed to learn from
  - You should ask many questions, to **understand as much as possible in advance:** both about about technical aspects and about company policies and environment
- **Judge based on facts**, not on rumors, claims, hopes. e.g.:
  - *company is using these technologies*, *published a cutting edge paper on this topic*, *has won the X award for most innovative company in Europe* are facts
  - "*I was told salaries are 2x in consultancy vs research*" is a rumor, "*We, as a company, are pursuing excellence since 1960*" is a (bold) auto-referral opinion, "*We are the most innovative company in 2019*" without an external, independent, endorsement is worth nothing.

Contacts

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- Feel free to reach out!