CYBER SECURITY AND BIG DATA
A Global Conversation with Prof. Italiano

On the 29 of November we had the pleasure to attend a lecture of professor Giuseppe F. Italiano (computer science).

It was a very dense lesson during which we faced many aspects of the reality shaped by a dramatic technological change, which we are currently living. It sounds absurd to think that twenty years ago we did not have Google, mobile phones or PCs. We have billions of "things" connected to the internet nowadays and these devices are producing data at an astonishing rate and the *Internet of Things* (IoT) is having an increasing impact on our ever-evolving lives.

We first addressed to the "**Big data**" issue. We refer to "Big Data" as all the information that we produce and circulate through social networks, web sites and emails. To understand big data we have to assume that they are characterized by 4Vs:
-Volume, we have an impressive quantity of data;
-Velocity, they are produced with an increasing velocity;
-Variety, they are different kinds (pictures, movies, texts);
-Veracity, uncertainty of data since their validity is often not proved.
An additional V can be added: the Value of data, indeed who owns data is rich (Facebook, Instagram, Google, etc.).

However, the real value does not lie in the data itself but in the *algorithms*, a fundamental tool to manage the huge quantity of data we have nowadays. They are used for several purposes, as for example to make predictions on our preferences or to predict which could be the perfect candidate for a job place or to study in a certain university. Let's examine the case of Google which became the first web engine in the world. Google was capable of merging different ingredients together, bringing it to its fame. First it used bigger machines to deals with PCs everywhere in the world and a new way of programming, then it was able to find faster algorithms, becoming more appealing for users. Google was in other words capable of creating a new market that nowadays could be hardly substituted. Then the last ingredient was that those algorithms were not only faster but also smarter: Google (or also Netflix, Amazon, Facebook and so on) can help us on our researches giving us advices based on our preferences or based on data acquired elsewhere. Thus the algorithms are everywhere and they changed the economy (just consider how the buying of things in virtual shops is widespread and increased in the last years), but the last point raises a big privacy issue, because if it is true that algorithms make life much more easier, it is also easier to compromise others' privacy thanks to the more available access to others' data and their prompt circulation. Other points are raised for the questionable fairness and accountability of algorithms, which are sometimes used for the enrollment procedure in the universities or for the assignation of a job place.

Another great issue raised is the one of the **Cyber security**: do we know what is dangerous in the digital world and how to protect ourselves from threats?

Those threats can be:
-        Criminal activities (credit card theft, child pornography, copyright infringement, etc.)
-        Incidents produced by insiders (both intentional or unintentional), the most dangerous
-        Terrorist groups (covert communications, funding, coordination): it is the most direct way for propaganda, planning and recruitment of people
-        States sponsored or corporate cyber espionage
-        Individuals/Hacktivists
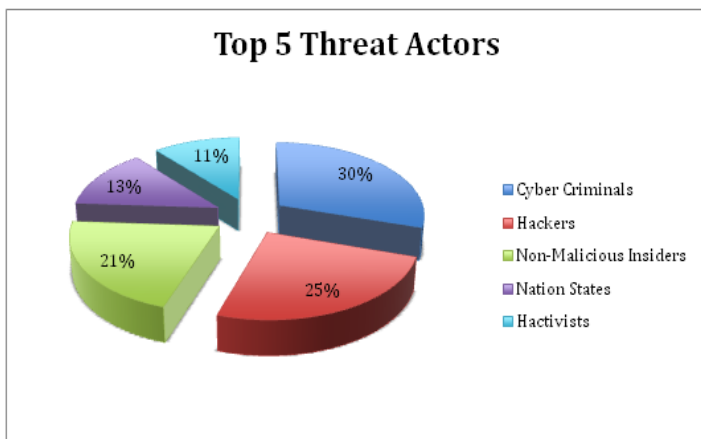
Nowadays most of our life is digital, the way we work, move and have fun, we can be defined as digital (cyber) citizens. Living in this situation, we have a lot of pros but as in everything else there is also the other side of the coin that is not so bright. Are we ready to face all the threats and are we aware enough of all the menaces that the cyber world hide to us? And are we willing to have our private affairs known by strangers that always have a look on us?

We can't stop the world from going through the path it has chosen, we can't stop this process that has already been enacted and furthermore we don't want to renounce to all the facilitations we got trough those years, so the only precaution we have is to be well-informed also about this part of our reality that is becoming bigger and bigger.

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