Rovesti Gabriel

[nome della società]

Advanced topics in computer network and security simple (for real)

Summary

[Course introduction 2](#_Toc147566130)

[How papers are made and carry out research 3](#_Toc147566131)

# Course introduction

The course is structured this way:

1. Advanced Topics

We will cover, through lectures and talks from invited speakers, recent and relevant security issues in traditional and novel technologies, such as:

* IoT and Cyber-Physical System
* (Adversarial) Machine Learning for Security
* Blockchain
* Advanced Cryptography Applications
* User Authentication

1. Students Presentations

* Students present to the class a given topic
  + Group of about 3 students
  + The topics are assigned (from a list available on course website) through a bidding phase, at the end of the Part I
  + Topics are like the one presented in Part I
* Students are also required to:
  + Send provoking questions regarding the topics presented by other groups
  + Interact with the presenting group during the lecture

Each group (as identified in Part II) is evaluated through a final project:

* The goal is identify improvement directions of a state-of-the-art problem
* The topic should be “close” to the one presented in Part II (topic shall be identified together with the lecturer)
* The work should be supported by experiments
* Essay (about 10 pages) + presentation of the project

The grading criteria works like this:

Immagine che contiene testo, schermata, Carattere, linea

Descrizione generata automaticamente

Going deeper, this is the evaluation:

Immagine che contiene testo, schermata, Carattere

Descrizione generata automaticamente

Projects can be:

* Proposed by the group and discussed with the teaching team to evaluate the feasibility
* Selected through a list of proposals presented by SPRITZ group members. There will be a project presentation in early December

# How papers are made and carry out research

There is a methodology in doing research, just like the scientific method (make observations, form hypotheses, experiment, analyze, report and reproduce results). In our case, it’s reading papers, attending talks, thinking and discussing (not falling into the *survivorship bias*, so focusing on some parts of the process thinking we’re collecting the right data, when actually we’re not, to analyze a particular phenomenon). Also, we make patents to create original ideas, and something not seen before (these are considered factual for the most part).

When we’re doing research, we’re at the edge of the knowledge, when we’re consolidating facts and things nobody knows to build new knowledge and facts. We’re not alone in this, it’s made by the community and other researchers as well, consolidating a clear understanding of themes. Keep in mind we’re designing sound experiments, constantly looking at data, criticizing the overall work and questioning constantly.

Papers usually range from 6/10 pages up to 30, made on the outside by:

* a title
* list of authors (affiliations)
* abstract to give the general idea and context
  + give the good idea to the right people, to try to invest further into your text (keep it short)
* introduction on the problem and its history, the motivation behind and the scientific motivations about the work and the contributions
* a section about related work, comparing what’s already there with our works, highlighting what our work does more than others

Inside instead, we structure like:

* description of the proposal, giving background knowledge, a formal definition of the problem and its method and the overall components
* experimental evaluation, implanting the experimenting and describing the tools used, presenting results and discussing limitations (supporting claims validly)
* conclusions, summarizing contributions and future research conclusions

The *review process* is made by picking a venue of evaluation to other scientists (journal/conference) keeping an eye to the deadline submission.

The venues can either be:

* scientifical journals, places established for several years, where there is a board of experts responsible of evaluating papers (chief/associate editors/reviewers)
* conferences, mostly one shot in a specifical place (many chairs like conference, submission, publicity chairs, etc./program committee members/reviewers)
  + it’s important to understand the quality of the conferences, looking into rankings
  + useful link: <https://people.engr.tamu.edu/guofei/sec_conf_stat.htm>

The chairs are responsible for the reviews and very few are accepted. We disclose information ethically, presenting good for a career’s sake but also having a good paper. To read papers, good places are IEEE Xplore, ACM Digital Library, Google Scholar, dblp, Springer Link, etc.

To assess a paper, it’s important to read it, analyzing the person impact, the author reputation, citations (more advanced: assessing researchers, looking for citing, h-index [used to quote the impact of a paper and uses as the index of number of citations by other authors at least that same number of times. For instance, an h-index of means that the scientist has published at least papers that have each been cited at least ] and more).

Also, one can look for the citation graph that describes the citations within a collection of documents, linking all the citation in between and see how problems were linked and solved.