FRANCESCO TOSONI

M.Sc. in Computer Science

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EDUCATION

M.Sc. in Computer Science and Networking (EQF 7)
Università di Pisa *and* Scuola Superiore Sant'Anna

📅 Nov 2017 – Mar 2020

The M.Sc. course in CS&N was a joint initiative of TeCIP institute (Scuola Sant'Anna) and the University of Pisa (Computer Science and Information Engineering departments). The course was conducted in English, with many international students. Main interests:

- Algorithm design, analysis and implementation
- Big Data analytics, Search Engines & Information Retrieval
- High performance Computing (HPC) and Parallel Computing (in particular: multi-thread)
- Networking (protocols, components, configuration & management), JUNOS network operating system, optical fibers

Thesis title: "*Algorithms and data structures for efficient ride sharing platforms*". Advisors: P. Ferragina, A. Marino. Date: 6th March 2020. Score: 110/110 *cum laude*.
Achieved 5 times the score 30/30 *cum laude*.
Served as a *student representative* for the Master's course (2018-2020).

B.Sc. in Computer and Electonic Engineering (EQF 6)
Università di Perugia

📅 Sep 2014 – Oct 2017   📍 Perugia, Italy

Bachelor courses:

- Foundations of Telecommunication, Signal Processing & Automation
- Algorithms, Databases & Computer programming: `Java` (mainly) and `C`
- Foundations of Antennas & Electronic circuities

Thesis title (translated): "*Implementation of a distributed graph clustering algorithm on the Giraph platform according to the TLAV paradigm*". Advisor: E. Di Giacomo. Date: 27th October 2017. Score: 110/110 *cum laude*.
Achieved 7 times the score 30/30 *cum laude*.

High school degree (EQF 4)
Liceo Scientifico annesso al convitto nazionale "Principe di Napoli"

📅 Sep 2009 – Jul 2014   📍 Assisi, Italy

Attended public High School of Science "Principe di Napoli" in Assisi (`www.convittoassisi.com`). In the final examination I presented a survey about criptographic methods. Score: 100/100

RECENT POSITIONS

Ph.D. student
Università di Pisa, CS Department

📅 Nov 2020 – ongoing   📍 Pisa, Italy

I am currently member of the Acube laboratory (`acube.di.unipi.it`) directed by professor Paolo Ferragina. My research interests range from algorithms for real world applications to information retrieval and big data analysis.

Research scholarship
Università di Pisa, CS Department

📅 Jun – Oct 2020   📍 Pisa, Italy

Title: *Algorithms and data structures for urban mobility platforms*. Duration: 5 months.
I worked on graph-based algorithmic solutions for vehicle routing and mobility problems.

INTERNSHIPS

Summer intern
EPLASS

📅 August 2014   📍 Würzburg, Bayern, Germany

Summer traineeship at EPLASS Project Collaboration Gmbh, an internet-based software developing company working with several countries all over the world. Worked with the `C#` Programming language.

Summer intern
Flyeralarm, Druckhaus Mainfranken

📅 August 2014   📍 Würzburg, Bayern, Germany

Intern at Flyeralarm GmbH, an online printing brand present in 15 european countries. During the internship I assisted different departments (i.e. customer phone calls, printing, manufacturing).

LANGUAGE SKILLS

Italiano (Italian)   ●●●●●
mother tongue

English   ●●●●○
B2 Certificate. Center for Applied Linguistics (CLA) of UNIPG, Perugia (Italy), July 2017

Deutsch (German)   ●●●○○
B1 Certificate. Center for Applied Linguistics (CLA) of UNIPG, Perugia (Italy), July 2017

PROGRAMMING LANGUAGES

Good knowledge of **Java**, **C/C++** (esp. c++11), and **Python 3**. I have also worked occasionally with: Python 2, Go, and Haskell.

PROJECTS

Algorithms and data structures for efficient ride sharing platforms
Master's thesis research fellow

📅 Apr 2019 – Feb 2020   📍 Pisa, Italy

Implementation of a novel locality filtering technique which is able to speed up matching computations for urban mobility problems. The proposed algorithm and data structure solve the ride sharing problem by significantly improving both the time and the space complexities. The thesis work has seen a collaboration with researchers at *CNR* (Pisa, Italy) and *MIT Senseable City Lab* (Boston, Massachusetts).

Parallel versions of the Particle Swarm Optimization method
Parallel and distributed programming course

📅 Fall 2019   📍 Pisa, Italy

Study for a map-reduce parallelization of the PSO procedure for the localization of a minimum within a 2-D plane. The parallel versions have been realized using: (1) c++ threads, as well as (2) the FastFlow parallel framework. The experiments have been executed on a *Intel Xeon Phi* machine (64 cores, 4-way hyper-threading).

SPADE – Sensing, Processing and Analyzing Data in an Embedded IoT Device
Wireless networks of embedded systems course

📅 Spring 2019   📍 Pisa, Italy

Design and deployment of a machine-learning powered system for the predictive maintenance of machines based on a Beagleboard green and an accelerometer.

Implementation of a distributed graph clustering algorithm
Bachelor's thesis

📅 Fall 2017   📍 Perugia, Italy

Distributed implentation of the LPAm clustering algorithm on top of the Apache Giraph platform. The programming paradigm of the Giraph library is "Think like a vertex" (TLAV), which aims at exploit better locality in data access and communications.

INTERESTS

intelligent transportation systems

graph algorithms   route optimization

data compression   big data

multicriteria data structures

HACKATHONS

🏆 **First Ascent 2018 finalist**
Selected from 400+ applicants for the participation in *First Ascent 2018*

FA18 (Copenhagen, Denmark) was a coding challenge event organized and sponsored by Bending Spoons. 20 Italian top tech students coming from many universities in Italy (Bologna, Cagliari, Padova, Pisa, Roma, Trento), England (Cambridge, Oxford, Imperial College London) and Germany (TUM) participated in the event. See: `firstascent.io`

❤️ **HackTheAlps, #weagainstvirus 2020, 3rd prize**
Awarded 3rd prize with *Pharma-Q* application prototype

HackTheAlps was aimed at proposing software solutions and ideas to assist local communities during the *COVID-19* emergency; our team developed an AI-enabled web service to monitor queues at the entrance of the pharmacies of Bozen/Bolzano, using data acquired through surveillance cameras. See: `hackthealps.it/weagainstvirus`

AWARDS

- €1500 - Awarded the **"Best Graduate Award" (Master in CS & Networking)** based on the best graduation grade, exam grades (GPA) and least amount of time spent to graduate, reserved for graduates from cohort 2017/2018 graduating in the academic year 2018/2019 .

- €1000 - Awarded the **"Best Master's Thesis Award 2020"**, reserved to master's student who graduated between August 1, 2019 and July 31, 2020. The prize was offered by *con.Scienze*, the National Conference of Presidents and Directors of scientific and technological university facilities; see `www.conscienze.it/premi_2020_vincitori.asp`.

OTHERS

- European Computer Driving Licence (ECDL)
- B – car driving licence

HOBBIES

In my spare time I like reading books (in this period especially the literature of the 20th century) and listening to music; I also like playing strategy video games.

Pisa, 19th March 2021