Gabriele Oliaro

28 DeWolfe Street • Cambridge, MA 02138 • gabriele_oliaro@college.harvard.edu • +1 (508) 638-8226

Education

HARVARD UNIVERSITY Cambridge, MA
B.S. Electrical Engineering. Minor in Computer Science. GPA 3.8 May 2021
Relevant Coursework: Big Data Systems (grad) • Advanced Computer Networks (grad) • Operating Systems • Systems Programming and Machine Organization • Machine Learning • Mathematical Programming & Optimization • Probability • Discrete Math for CS • Linear Algebra • Multivariable Calculus • Signals and Systems • Feedback and Control • Circuits and Electronics • Electronic and Photonic Devices • Quantum Physics • Econometrics.

ISTITUTO LEONE XIII Milan, Italy
High School diploma in Classics. Final grade 100/100 July 2017
Main Coursework: Ancient Greek, Latin, History, Philosophy, Literature

VASHON ISLAND HIGH SCHOOL Seattle Area, WA
Exchange Student. GPA 4.0 Sept. 2015 – July 2016
SAT: 1520/1600. SAT Subject Tests: 800 (Math II), 800 (Physics), 800 (Latin)

Research and Teaching Experience

UNIVERSITY OF CALIFORNIA, BERKELEY Berkeley, CA
Undergraduate Researcher with Prof. Ion Stoica @ Real-time Intelligent Secure Explainable systems (RISE) Lab June – August 2020

- Improved the throughput of cluster-computing framework Ray by pipelining the submission of tasks to worker nodes
- Used a work-stealing mechanism to rebalance work among worker nodes
- Tested the code, measured performance, and committed to Ray's open-source repository, with 13.7K stars on Github
- Presented the work with a poster at the Fall 2020 Poster session at the RISE Lab

HARVARD SCHOOL OF ENGINEERING AND APPLIED SCIENCES Cambridge, MA
Undergraduate Researcher with Prof. Minlan Yu Sept 2020 – Present

- Contribute to the design and implementation of a low-overhead in-band network telemetry framework for programmable switches
- Implement a distributed filtering mechanism, together with a change-detection data-structure to filter out redundant network telemetry
- Improve the INT framework to minimize the reports sent to collectors
- Write an undergraduate thesis (work in progress) with title "Probabilistic In-band Telemetry CHeckER (PITCHER)"

Undergraduate Researcher with Prof. Eddie Kohler May 2019 – June 2020

- Developed a user-level networking stack for Lua adapting open-source library picoTCP and integrating it with Lua's coroutine-based non-preemptive multitasking
- Wrote code to help support live migration of Lua-based FaaS without interrupting active TCP connections
- Designed a benchmarking suite to measure network metrics such as throughput and latency and facilitated optimization of such values
- Design and implement a single-threaded, multiclient HTTP server in Lua that can be live-migrated and that supports the WebSocket protocol
- Designed a Juice-based IoT platform as a case study
- Wrote and debugged large codebase in C, C++, Lua and Python.
- Co-authored a paper titled "Juice: Concentrated Application State for Stateful Serverless Platforms," submitted to NSDI '21

Teaching Assistant with Prof. David Malan Aug. – Dec. 2018

- Teaching Assistant for Harvard's Introductory Computer Science course, CS50.
- Lead weekly 1h15min-sections to a group of ~20 students, hold office hours, grade problem sets and exams
- Contribute to hosting & organizing course-wide events such as the CS50 Puzzle Day, the CS50 Hackathon and CS50 Fair, where students showcase their final projects.

POLITECNICO DI MILANO Milan, Italy
Undergraduate Researcher with Prof. Andrea Bonarini @ Artificial Intelligence and Robotics Lab (AirLab) May – Aug. 2018

- Contribute to a state-of-the-art machine learning framework to enable moving robots to track moving entities and detect humans
- Design and implement a detection algorithm based on a mixture of gaussian processes (MGP)
- Train the detection algorithm using LIDAR data from a custom-designed robot named *Tryskar*
- Write code in Python and C++ to interface with ROS

Select Projects

Chickadee Jan – May 2019

- Designed and implemented a whole multi-core kernel as term-time project for CS 161 at Harvard
- Managed and debugged large codebase in C++ with synchronization
- Implemented virtual memory, buddy allocator, processes, threads, wait queues, file system, disk support, buffer cache, signals and system calls.

Let's Meet! Nov. – Dec. 2018

- iOS app that enables users to instantly find people with whom they can study, eat lunch and do other activities – all without worrying about bothering people who don't happen to be available at the same time as you
- Designed front-end of the app in XCode and wrote code in Swift. Set up the backend using a custom MySQL online database and a REST API written in PHP and SQL

SGAST (Series Graphing and Solving Tool) Sept. – Dec. 2016

- Java app that helps high school and college students learn infinite series.
- Designed app in Eclipse, wrote code in Java.

Skills

Natural Languages: Italian (native), English, Latin, Ancient Greek
Programming Languages: C, C++, Python, Java, Lua, P4, PHP, Swift, Stata, AMPL, Mathematica, MATLAB, LaTeX
Techniques: Data Structures, Algorithms, Debugging, Operating Systems, Computer Networking, MySQL, REST API, Git