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Tommaso Bonato

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EDUCATION

Ph.D. Computer Science — **ETH Zürich** — **Jan 2023 – Jan 2027**
- Part of the Scalable Parallel Computing Lab (SPCL) under Prof. Torsten Hoefler.
- Research focus: High-performance network topologies, traffic load balancing, congestion control for large-scale systems, AI workloads.

M.S. Computer Science — **ETH Zürich** — **Sept 2018 – Nov 2021**
- Final thesis: ”Analysis of the Adaptive Routing Algorithm in the Slingshot Interconnect” with Hewlett-Packard.
- Final GPA: 5.31/6.00.

B.S. Computer Science — **University of Bologna** — **Sept 2014 – Mar 2018**
- Final graduation grade: 110/110 with honors. Cumulative GPA 29.1/30.
- Final thesis: “Time series predictions with Recurrent Neural Networks”.
- Studied abroad for one year (2016–2017) at the University of California, Santa Cruz after winning a scholarship.

WORK EXPERIENCE

Research Engineer (Part-Time) — **Microsoft (via Experis)** — **Aug 2022 – Dec 2025**
- Design and prototype network transport protocols for Azure’s AI and HPC infrastructure as part of the Network Architecture team, shaping next-generation datacenter fabrics.
- One of Microsoft’s representatives for the Ultra Ethernet (UE) Transport Working Group, helping shape the design of its congestion control and load balancing.
- Developed proofs of concept in inter-datacenter congestion control and reliability, co-design of networking and AI workloads, and packet- and flow-level load-balancing schemes for datacenters.
- Improved and extended Microsoft’s C++ htsim-based simulator used to evaluate new networking technologies.

Software Engineer, Intern — **Amazon** — **Feb 2019 – Jul 2019**
- Worked in the EU Transportation team on cap recommendation systems to mitigate short-term transportation capacity shortages, contributing to estimated yearly savings of 5M USD.
- Built an LSTM model in Keras which sent out daily recommendations using various AWS services.
- Developed automated alerts to detect capacity misconfigurations for Prime Day and planned holidays; the system caught multiple high-priority misconfigurations, improving both cost and delivery speed.

Software Engineer, Intern — **Imola Informatica** — **Jun 2018 – Aug 2018**
- Developed a full-stack system using Java and JavaScript to automate retrieving and intuitively displaying the most important information from Red Hat OpenShift using an interactive graph.

Software Engineer, Intern — **European Space Agency** — **Jul 2017 – Oct 2017**
- Developed models and tools for analyzing data from the NASA/ESA/CSA James Webb Space Telescope (launched in December 2021).
- Integrated C++ libraries from Sandia National Laboratories into a Fortran codebase, achieving a 4× speedup.

SELECTED PUBLICATIONS

- **Uno: A One-Stop Solution for Inter- and Intra-Datacenter Congestion Control and Reliable Connectivity**. *SC’25.* Unified transport for AI-scale intra/inter-DC networks.
- **ATLAHS: An Application-centric Network Simulator Toolchain for AI, HPC, and Distributed Storage**. *SC’25, Best Student Paper Candidate.* Toolchain that captures real AI/HPC/storage workloads and replays them efficiently in multiple network simulators.
- **REPS: Recycled Entropy Packet Spraying for Adaptive Load Balancing and Failure Mitigation**. *EuroSys ’26.* Packet-level load-balancing algorithm with fast failure reaction tailored to modern datacenter fabrics.

LANGUAGES AND TECHNOLOGIES

- Proficient: C/C++, Python
- Familiar: MPI, NCCL, RDMA, Bash, Git, Docker, Linux
- Domains: Datacenter networking, congestion control, load balancing, HPC/AI systems, network simulators (htsim, NS-3, SST)