TMA Conference 2023

Proceedings of the 7th Network Traffic Measurement and Analysis Conference

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1 Message from the Chairs

As our network infrastructures evolve, embracing softwareization, cloudification, and native AI support, we are witnessing transformations in how we construct and manage these systems. However, these advancements also challenge us to reevaluate and simplify our measurement practices and methodologies, from the basic physical layer up to the intricate applications in the cloud. Measuring these systems with precision and simplicity is the first crucial step before we can innovate, optimize, or even maintain them.

In this context, The Network Traffic Measurement and Analysis Conference, **TMA Conference**, plays a key role by being a vibrant meeting point for scientists and engineers from academia and industry, offering a platform for lively interactions and the exchange and confrontation of diverse ideas, thus creating even richer ideas.

This year, **TMA 2023 accepted 15 technical papers out of 51 submissions**. The paper review process included an evaluation phase by PC members, in which, additionally this year, reviewers had to additionally rate the papers in terms of exposing their own limitations, and avoiding the trap of overselling results. This was followed by an online discussion and a subsequent shepherding phase on selected papers. In some papers, we relied on extra feedback from external experts. The resulting program features a variety of high-quality papers focusing on different aspects of network measurement and analysis. Also, the proceedings include **10 extended abstracts** reporting preliminary results on cutting-edge topics.

The conference additionally featured the following two exciting **keynote talks**:

1. "Leveraging GNN to build a Network Digital Twin" by Pere Barlet-Ros from UPC Barcelona.
2. "The Hitchhiker's Guide to Network Security Measurement: Leveraging AI in Dynamic Environments" by Sebastián García from Czech Technical University in Prague.

The **top 3 best papers** from the main conference were acknowledged and invited for fast-tracking at the IEEE Transactions on Network and Service Management journal.

- "Target Acquired? Evaluating Generation Algorithms for IPv6", by L. Steger, L. Kuang, J. Zirngibl, G. Carle, O. Gasser.
- "Live Long and Prosper: Analyzing Long-Lived MOAS Prefixes in BGP" by K. Zubair Sediqi, A. Feldmann, O. Gasser
- "Instant Messaging Meets Video Conferencing: Studying the Performance of IM Video Calls" by L. Grote, I. Kunze, C. Sander, K. Wehrle

The **best paper award** was assigned to the first,"Target Acquired? Evaluating Generation Algorithms for IPv6", by L. Steger, L. Kuang, J. Zirngibl, G. Carle, O. Gasser.

Attendees also voted for the **best poster (extended abstract)**, which was ultimately assigned to:

- "Towards Detecting and Geolocalizing Web Scrapers with Round Trip Time Measurements" by E. Chiapponi, M. Dacier and O. Thonnard

Finally, we also had a **best reviewer award** which was granted to Alessandro Finamore for his quality detailed reviews and engagement in the process.

The conference also hosted the **11th TMA PhD school**, started back in 2010 and recognized as the most important PhD school in network measurement and analysis topics today.

Four distinguished speakers were invited to deliver lectures: Cristel Pelsser, Pascal Mérindol, Luca Vassio and Kevin Vermeulen.

Also, the PhD school assigned **two best poster awards**:

1. "Performance Estimation of Encrypted Video Streaming Considering End-user Playback-related Interactions", by I. Bartolec, L. Skorin-Kapov
2. "Synthetic and Privacy-preserving Traffic Trace Generation for Training Network Intrusion Detection Systems", by C. Guida, G. Aceto, F. Giampaolo, A. Pescapè, F. Piccialli, E. Prezioso

TMA Conference 2023 has been a great success. We hope that all the attendees enjoyed the program and that the event has inspired fruitful future ideas and collaborations.

Johanna Ullrich and Zied Ben Houidi from SBA Research & University of Vienna and Huawei Technologies, respectively, along with Alessio Botta and Antonio Pescapè from University of Napoli "Federico II" served as TMA Conference 2023 program chairs and general chairs.

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Session 1: Traffic Classification & Modelling (chair: Zied Ben Houidi)

- **Encrypted Traffic Classification: the QUIC Case**
  J. Luxemburk, K. Hynek, T. Cejka

- **Many or Few Samples? Comparing Transfer, Contrastive and Meta-Learning in Encrypted Traffic Classification**
  I. Guarino, C. Wang, A. Finamore, A. Pescapè, D. Rossi

- **dMAPAR-HMM: Reforming Traffic Model for Improving Performance Bound with Stochastic Network Calculus**
  Q. Yang, X. Peng, H. Yang, G. Zhang, B. Bai

Session 2: Posters' Session (Extended Abstracts)

- **Not all DGAs are Born the Same - Lexicographic based Detection of DGA Domains through AI/ML**
  L. Torrealba, P. Casas, J. Bustos-Jiménez, G. Capdehourat, M. Findrik

- **Unevenly Spaced Time Series from Network Traffic**
  J. Koumar, T. Cejka

- **Towards Detecting and Geolocalizing Web Scrapers with Round Trip Time Measurements**
  E. Chiapponi, M. Dacier, O. Thonnard

- **Detecting IP-tracking proof interfaces by looking for NATs**
  A. Buchet, P. Snyder, H. Haddadi, C. Pelsser

- **Phishing in Style: Characterizing Phishing Websites in the Wild**
  D. Hasselquist, E. Kihlberg Gawell, A. Karlström, N. Carlsson

- **An Initial Look into the Performance Evolution of 5G Non-Standalone Networks**
  G. Caso, M. Rajiullah, K. Kousias, U. Ali, L. De Nardis, A. Brunström, O. Alay, M. Neri, M. G. Di Benedetto

- **Packet Field Tree: a Hybrid Approach to Automated Protocol Reverse-Engineering**
  A. Rohl, M. Roughan, M. White, A. Chambers

- **France Through the Lens of Mobile Traffic Data**
  O. E. Martinez-Durive, S. Mishra, C. Ziemlicki, S. Rubrichi, Z. Smoreda, M. Fiore

- **Deep Generative Replay for Multivariate Time-Series Monitoring with Variational Autoencoders**
  G. García González, P. Casas, A. Fernández

- **Investigating Gaze Behavior in Phishing Email Identification**
  F. Pietrantonio, A. Botta, G. Ventre, L. Gallo, S. Zinno, L. Mancuso, R. Presta

Session 3: Security (chair: Pere Barlet-Ros)

- **Hazardous Echoes: The DNS Resolvers that Should Be Put on Mute**
  R. Yazdani, Y. Nosyk, R. Holz, M. Korczynski, M. Jonker, A. Sperotto

- **W-Bad: Interception, Inspection, and Interference with Web Proxy Auto-Discovery (WPAD)**
  C. Deccio

- **Your Code is 0000: An Analysis of the Disposable Phone Numbers Ecosystem**
  J. M. Moreno, S. Matic, N. Vallina-Rodriguez, J. Tapiador

Session 4: Insights on Network Infrastructure (chair: Matteo Varvello)

- **An Analysis of War Impact on Ukrainian Critical Infrastructure through Network Measurements**
  R. Singla, S. Srinivasa, N. Reddy, J. M. Pedersen, E. Vasilomanolakis, R. Bettati

- **Live Long and Prosper: Analyzing Long-Lived MOAS Prefixes in BGP**
  K. Z. Sediqi, A. Feldmann, O. Gasser

- **Target Acquired? Evaluating Target Generation Algorithms for IPv6**
  L. Steger, L. Kuang, J. Zirngibl, G. Carle, O. Gasser

Session 5: Performance Analysis & Measurements (chair: Idilio Drago)

- **Instant Messaging Meets Video Conferencing: Studying the Performance of IM Video Calls**
  L. Grote, I. Kunze, C. Sander, K. Wehrle

- **A Worldwide Look Into Mobile Access Networks Through the Eyes of AmiGos**
  M. Varvello, Y. Zaki

- **Longitudinal Analysis of Inter-city Network Delays**
  S. Ozcan, I. Livadariu, G. Smaragdakis, C. Griwodz

Session 6: The Human Factor (chair: Anna Brunström)

- **Bias in Internet Measurement Platforms**
  P. Sermpezis, L. Prehn, S. Kostoglou, M. Flores, A. Vakali, E. Aben

- **Errare humanum est: What do RFC Errata say about Internet Standards?**
  S. McQuistin, M. Karan, P. Khare, C. Perkins, M. Purver, P. Healey, I. Castro, G. Tyson

- **I refuse if you let me: Studying User Behavior with Privacy Banners at Scale**
  N. Jha, M. Trevisan, M. Mellia, R. Irarrazaval, D. Fernandez