

IWNTA 2021

International Workshop on Network Traffic Analytics (IWNTA 2021)

In conjunction with

MobiSPC 2021

The 18th International Conference on Mobile Systems and Pervasive Computing

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The clear understanding of the processes occurring in networks is paramount for multiple stakeholders, including network operators, who aim at the full visibility required by both network management and security. Accordingly, devising a suitable set of tools for performing network traffic analytics is of the utmost importance to understand its peculiarities, predict its characteristics, enforce traffic engineering, perform network planning and provisioning, manage the QoS, profile user activities, identify anomalies, emulate real traffic for testing purposes, etc.

However, this process is challenged by the nature of the traffic traversing today's networks which is impacted by the way users behave, interact, and access the network. In fact, operators have experienced in the last years tremendous growth of the traffic to be managed in their networks, mostly generated by mobile and IoT devices, according to the latest reports from big network players it is forecasted that mobile subscriptions will reach around 9 billions by 2025, corresponding to mobile data traffic of 160 exabytes per month. This phenomenon exacerbates the need for accurate characterization, classification, modeling, and predictability of network traffic generated by a plethora of heterogeneous devices at different degrees of granularity. In fact, the implementation of effective approaches for fine-grained traffic analytics must overcome several challenges. One is the broad adoption of encrypted protocols, e.g. Transport Layer Security (TLS), which currently represents the majority of traffic. Also, network traffic is increasingly becoming an extremely complex and dynamic phenomenon, leading to wildly-different and complex fingerprints.

On the one hand, global network solutions providers tend to prefer the applicability of model-based approaches due to the interpretability. On the other hand, ML/DL techniques have sought increasing attention due to their ability in solving complex tasks with data-driven procedures. Unfortunately, the data-driven characteristics exacerbate the difficulties in designing and evaluating the latter techniques when applied to traffic analytics. These issues are the more worrying the less interpretable the ML/DL technique is, with the currently-popular neural networks (in their deep learning "flavor") representing the most exposed ones.

Finally, the availability of high-quality and up-to-date datasets and ground truths for needed analyses is quite limited, given both the variety and the dynamicity of services/apps generating traffic, and the privacy concerns implied in the collection and sharing of such data. Hence, the design of network traffic analytic tools remains an open and hot challenge, and innovative approaches are needed to ensure satisfactory traffic visibility while having theoretically-solid and easily-interpretable views of the traffic.

Accordingly, the aim of this Workshop is to provide an overview on recent advances and challenges in network traffic analytics. In line with the interesting research efforts in the field of ML and DL, the workshop solicits contributions related to the application of these techniques in critical networking scenarios, such as IoT or Industry 4.0 systems, with a focus on horizontal tasks such as traffic modeling, classification, prediction or more vertical applications of analytics in challenging scenarios such as Fog and Cloud. This workshop offers the opportunity for researchers and practitioners to identify new promising research directions as well as to publish recent advances in this area.

Workshop topics include, but are not limited to:

- Mobile and IoT traffic characterization
- AI-based approaches for traffic analysis
- Network anomaly and misuse detection
- Machine and Deep Learning approaches for network analytics
- Model-based (statistical) approaches for network analytics
- Characterization of open network traffic data and reproducibility
- Interpretability in ML-based network analytics tool
- Vertical use cases for network analytics including Mobile Traffic, IoT, Crypto-mining applications, anonymity tools, Industry 4.0

- Applications of network analytics in fog and cloud scenarios
- Prototypical implementation of network traffic analysis tools

General Chairs

Domenico Ciunzo, University of Napoli Federico II, Italy

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Important Dates

Workshop paper submission deadline: April 25th, 2021

Notification of workshop paper acceptance: May 17th, 2021

Submission of camera-ready workshop papers due: June 15th, 2021

Submission Guidelines

All papers should be submitted via **Easy Chair** through the link <https://easychair.org/conferences/?conf=iwnta2021>. Authors are required to submit fully formatted, original papers (in PDF format), and should be no more than 6 pages (including tables, figures, and references) formatted according to the guidelines of *Procedia Computer Science* (templates can be downloaded at <http://traffic.comics.unina.it/IWNTA2021/>). Papers exceeding 6 pages will not be accepted by Easy Chair. At least one author of each accepted paper is required to register to the workshop. All accepted and registered papers will be published in the Elsevier proceedings. **Given the current pandemic situation, in-person authors' participation is not mandatory. All IWNTA 2021 accepted papers will be published by Elsevier Science in the open-access *Procedia Computer Science* series on-line (indexed by Scopus and EI).**