View metadata, citation and similar papers at core.ac.uk

brought to you by CORE

provided by PORTO@iris (Publications Open Repository TOrino - Politecnico di Torino)

POLITECNICO DI TORINO
Repository ISTITUZIONALE

Workshop WAIN: Welcome message

Original
Workshop WAIN: Welcome message / Vassio, L.; Zhang, Z. -L.; Lee, S. -J.. - In: PERFORMANCE EVALUATION REVIEW. - ISSN 0163-5999. - STAMPA. - 46:3(2019), p. V.

Availability:
This version is available at: 11583/2838491 since: 2020-07-06T14:58:18Z

Publisher:
Association for Computing Machinery

Published
DOI:

Terms of use:
openAccess

This article is made available under terms and conditions as specified in the corresponding bibliographic description in the repository

Publisher copyright
acm_proc

© {Owner/Author | ACM} {Year}. This is the author's version of the work. It is posted here for your personal use. Not for redistribution. The definitive Version of Record was published in {Source Publication}, http://dx.doi.org/10.1145/{number}

(Article begins on next page)

04 August 2020

Message from the General Chair

Welcome to the 36th 2018 IFIP Performance Conference, held on the campus of ENSEEIHT, December 5-7 in Toulouse. The conference remains a leader in promoting cutting-edge research in the areas of modeling, measurements, and performance evaluation of communication systems.

The program of the main conference is formed by keynote talks by Leandros Tassiulas and Patrick Thiran, and 24 paper presentations organized in 8 sessions, spanning theoretical contributions, as well as modeling and analysis of novel technologies.

Performance 2018 was made possible by the hard work of many volunteers, and I would like to thank all of them for their time and dedication. The IFIP steering committee members Sem Borst, Benny van Houdt and Mark Squillante provided, through their experience and advice, valuable organizational assistance and guidance throughout the entire process of organizing the event. The TPC chairs John L. Lui, Michel Mandjes and Debasis Mitra assembled a strong program committee, and ran the review process. Also, I would like to thank the program committee members who volunteered their time to identify a strong set of papers for presentation. Manu Gupta maintained the conference web page and I thank him for always being on call to make the necessary changes that kept the page up-to-date. Tejas Bodas helped setting up and configuring the submission web server. Publication chair Marko Boon handled the preparation of the proceedings booklet and ensured a smooth publication process. Student travel grant chair Jonatha Anselmi arranged for travel support that helped many students attend the event. Marlène Giamporcaro, Estelle Henry and Maaike Verloop, took care of many practical aspects of the organization including registrations and organization of social events.

An exciting new feature of IFIP Performance 2018 is that it will host four half-a-day workshops. I wish to extend a special thanks to Balakrishna Prabhu as workshop chair, who was instrumental in organizing and coordinating the process that led to the organization of these new workshops. The success of this new initiative is largely due to the all the workshop organizers who did a great job in putting together very interesting sessions of talks.

Several institutions played a key role in the organization of the conference. My gratitude goes to INP-ENSEEIHT for providing the conference venue, IRIT-CNRS for help in organizational matters including setting up the submission website, and the French region of Languedoc-Roussillon Midi Pyrenees for their financial contribution. Last but not least, the sponsorship provided by ACM Sigmetrics, the Computer Performance Foundation and Nokia Bell Labs improved both the quality and accessibility of the conference.

I hope that Performance 2018 will be an occasion for all the participants to renew acquaintances, to make new friends, and to discuss problems and new ideas.

Enjoy the Conference!

Urtzi Ayesta
Performance 2018 General Chair

Message from the Program Chairs

This special issue of SIGMETRICS Performance Evaluation Review contains the papers presented at the 36th International Symposium on Computer Performance, Modeling, Measurements and Evaluation 2018, held in Toulouse, France, December 5-7, 2018. The Performance conference is a leading international venue for high quality state-of-the art research in the area of performance modeling, measurement, analysis, and evaluation of computer, communication, and information processing systems.

This year's program contains a mix of short and long papers of broad interest to the modeling and performance evaluation community. They cover a range of topics which combine methodological studies with models and analyses of recent innovations in computing, communications and information technologies. To some extent the program indeed reflects our original intent to broaden the scope of the conference, as indicated in the topics of interest in the Call for Papers. The new topics include, for instance, Blockchains, Net Neutrality, EVs, Network Science and Network Economics. It is our hope that the message sent to the community this year will influence the scope of future Performance conferences.

We received 37 long paper submissions and 14 short paper submissions. All paper submissions received 4-5 reviews. All reviews were completed by TPC members and a (virtual) program committee meeting was held July 12th. As a result of the reviews, online discussions, and TPC meeting, 19 long papers and 5 short papers were accepted into the program. The Stephen S. Lavenberg Best Student Paper Award was selected by a committee comprising the Program Committee Co-chairs and the WG 7.3 Chair, and awarded to "SRPT for Multiserver Systems" by Isaac Grosof, Ziv Scully, and Mor Harchol-Balter (all from Carnegie-Mellon University, Pittsburgh, United States).

Many people have contributed to the success of Performance 2018. First, we thank all authors for contributing their work. Second, we thank the TPC members, who were diligent and thorough in their reviews, online discussions, and participation in the TPC meeting. The General Chair Urtzi Ayesta and the IFIP WG7.3 Chair Mark Squillante provided much leadership and direction. Finally, we would like to thank Kechao Cai for the unstinted and extensive support that he gave us on various administrative and technical matters.

We hope you enjoy Performance 2018!

John Lui, Michel Mandjes, and Debasis Mitra

Performance 2018 Program Committee Co-chairs

Message from the Workshop Chair

The past few years have seen the emergence of several technologies that have opened new horizons for the Performance community. Artificial Intelligence (AI), 5G networks, and smart-grids come to mind as examples of exciting domains in which new methodologies and techniques for performance evaluation will be needed to bring these technologies to full fruition. To foster discussions and initiate collaborations on these hot-topics, it was decided to organize several thematic workshops to be collocated with the main conference, with each workshop focusing on a given hot-topic.

For this first edition of workshops, we are glad to present four half-day events that will be held in parallel on the afternoon of the 6th of December. The workshop on Performance and Modelling of Energy Systems (ePerf) has invited some of the leading researchers in the field of energy networks to share their vision, experiences, and results. The topic of the second workshop, Performance evaluation of Satellite Networks (PESN), is closely related to the host city, Toulouse, which is the aerospace capital of Europe. This workshop brings together researchers working on problems arising from integration of 5G and satellite networks. The third workshop, Symposium on Cryptocurrency Analysis (SOCCA), focuses on Cryptocurrencies, a topic that has the potential to shape the economic and monetary future of our societies. Finally, the Workshop on Artificial Intelligence (WAIN) will showcase the latest theoretical as well as experimental results in the field of AI.

The workshops would not have been possible without the efforts and help of several people. First, and foremost, my sincere gratitude goes to all the workshops organizers – Prashant Shenoy and Omid Ardakanian for ePerf; André-Luc Beylot, Riadh Dhaou, Giovanni Giambene for PESN; William Knottenbelt and Katinka Wolter for SOCCA; and, Luca Vassio, Zhi-Li Zhang, and Sung-Ju Lee for WAIN – for accepting to organize their workshops. It is mainly thanks to their efforts that a great program could be assembled at a short notice. Special thanks are due to Urtzi Ayesta, the General Chair, who was part of the organizational process right from its beginning. Finally, I would like to thank the Steering Committee of IFIP Performance for giving me the opportunity to coordinate the organization of these workshops.

I hope you all will enjoy the various talks, and that these workshops will serve their purpose of fostering discussions and collaborations on these exciting topics.

Balakrishna Prabhu
Workshop Chair

Workshop SOCCA: welcome message

We are delighted to welcome you to the *1st Symposium on Cryptocurrency Analysis (SOCCA 2018)*, which is being held in Toulouse, France, on Thursday 6 December 2018, co-located with Performance 2018. This symposium aims to bring together researchers, performance modellers and practitioners interested in quantitative aspects of two of the most exciting emerging technologies of our times, namely cryptocurrency and blockchain technology. Aspects of interest include performance, dependability, energy-efficiency, profitability and scalability.

The programme includes two keynote talks, from Aad van Moorsel and Ricardo Perez-Marco, and presentations associated with six peer-reviewed papers covering diverse topics from the dynamics of blockchain data structures to intelligent decision making in the context of cryptocurrency mining. The methodologies employed are equally diverse, and include queueing theory, simulation, machine learning and game theory.

SOCCA has only materialised due to the efforts of its dedicated supporting team. We would like to thank the Technical Programme Committee: Arthur Gervais, Anthony E. Krzesinski, Roger Wattenhofer, Sebastian Faust, Pedro Moreno-Sanchez, Edgar Weippl, and Philip Treleaven, for their constructive and swift reviewing. We also thank Dominik Harz and Alexei Zamyatin for creating and maintaining the symposium website (https://socca.science), and Sam Werner for promoting the symposium to a wide audience in his role as Publicity Chair. Finally, our sincere thanks go to the Freie Universität Berlin for their generous sponsorship of this event.

It is our hope that this symposium will be the first of many, and that the talks will stimulate many conversations and collaborations which will in turn lead to many more talented performance modellers turning their minds to the challenges of the cryptocurrency and blockchain domains.

William Knottenbelt and Katinka Wolter
Organizers of SOCCA

Workshop ePerf: welcome message

It is our great pleasure to organize the 1st Workshop on *Performance and Modelling of Energy Systems (ePerf)* at the Performance 2018 in Toulouse, France. This workshop aims to explore how improvements to or new uses of Information and Communication Technology (ICT) can improve the environmental sustainability of computer systems, networks, and applications as well as cyber-physical systems (e.g., buildings, power grids, and transportation systems). ePerf is intended to bring together researchers from the Performance community with researchers and practitioners in the Energy Systems and Informatics area, to exchange technical ideas and experiences on issues related to energy systems, sustainability and ICT.

We thank the speakers for presenting their high-quality research at the workshop and the organization committee of IFIP Performance 2018 for contributing to the realization of this event.

We sincerely hope you find this workshop informative and enjoyable, and that it will bring you new perspectives for your research in this emerging field of Energy Systems.

Prashant Shenoy and Omid Ardakanian
Organizers of ePerf

Workshop PESN: welcome message

It is a great pleasure to welcome you to the 1st International Workshop on Performance Evaluation of Satellite Networks (PESN 2018) held in conjunction with IFIP Performance 2018. It comes in the context of evolution of satellite networks to integrate a wide range of services and to support heterogeneous traffic and services in the 5G and IoT era, raising new challenges in modeling and performance evaluation. The evolution of satellite networks towards the 5th generation of networks and towards virtualization architectures and the renewal of satellite constellations are generating new problems of modeling complex systems, simulation, and experimentation. New test and measurement platforms and emulation tools will be exposed in this workshop.

The PESN 2018 program consists of eight talks and one demonstration, all based on high-quality and valuable invited contributions from research communities working on diversified aspects of telecommunication and networking on satellite systems. Many people contributed to the success of PESN 2018. First, we would like to thank the organizing committee of IFIP Performance for giving us the opportunity to organize PESN 2018. We thank all of the authors and speakers of the workshop for submitting their research work and for their participation. We look forward to meeting them again in the forthcoming editions of the workshop. Finally, we thank the Local Arrangement Chairs for the local arrangement of the workshop. We hope you will enjoy the workshop and have a great time in Toulouse.

André-Luc Beylot, Riadh Dhaou, Giovanni Giambene
Organizers of PESN

Workshop WAIN: welcome message

WAIN 2018 shows how AI can be effectively used in many networking areas, such as cyber-security, event correlation and prediction, log analysis, and design optimization, just to name a few. The complexity of today networks makes it challenging to design scalable network measurement and analysis techniques and tools. Machine learning and big data analytics techniques help to shed light on this enormous amount of data. Still smart and scalable approaches must be conceived to make them applicable to the networking practice.
The papers presented at WAIN workshop show to the community new contributions in this field, presenting smart approaches for understanding when and how applying AI in networking. Moreover, the workshop represents an important venue for researchers to share their experiences and ideas and discuss the open issues.

Luca Vassio, Zhi-Li Zhang, and Sung-Ju Lee
Organizers of WAIN

Richard Gibbens: In Memoriam

Richard J. Gibbens passed away on 12 August 2018 after a short illness, aged 56. He was Reader in Network Modelling in the Computer Laboratory of the University of Cambridge, and was due to become the Professor of Network Modelling in October 2018. He was Program co-Chair and co-edited the Proceedings of the IFIP Performance 2013 Conference, and a member of the TPC for Performance 2018.

Richard came to Cambridge as a mathematics undergraduate in 1980 and received his PhD in 1988. His doctoral thesis, on Dynamic Alternative Routing (DAR), was based on work performed with David Songhurst and Peter Key at British Telecom's Laboratories at Martlesham and with Frank Kelly in Cambridge. DAR provided a call-routing procedure in telephone networks for choosing alternative call paths when the primary path between a source and destination was blocked; the work was presented at the 12th International Teletraffic Congress (ITC) in Turin in 1988. Key to the success of DAR was the ability to determine the alternative paths online and in real time with limited information. DAR's success led to implementation in the British Telecom network and Richard's work attracted international attention.

There followed a postdoctoral year at Bell Labs, in the Mathematics of Networks and Systems Research Department led by Debasis Mitra, when his interests included state-dependent routing, a topic of importance to AT&T's network at that time. Richard made lifelong friends during his stay, and it left him with a lasting love for the United States. His period at Bell Labs was a formative influence on Richard's work, an example being his later important paper with Phil Hunt on effective bandwidths on the multi-type uniform arrival and service channel. European collaborations were also valued by Richard, and he was an active contributor to several EU sponsored programmes. Richard was a pioneer of work on measurement-based distributed admission control for packet networks and incentive mechanisms within and between congested networks.

In 1993 Richard was awarded a prestigious Royal Society University Research Fellowship. Richard was an early example of what we would now call a data scientist. In the Statistical Laboratory in Cambridge during the 1990s he was a tireless early advocate of first S-plus and then the R programming language for data analysis in research and teaching. It was natural when the Alan Turing Institute, with its focus on data science and artificial intelligence, was founded in 2015 that Richard should be one of its first Turing Fellows.

Richard became a University Lecturer in the Computer Laboratory and a Fellow of Gonville and Caius College, Cambridge, in 2001. His research interests extended from communication networks to road transport networks and energy networks. He developed algorithms to predict journey times on road networks from a fusing of historic and real-time data, and for the optimal control of large-scale electricity storage. Most recently he was, with Don Towsley, working on an International Technology Alliance between the US Army Research Laboratory and the UK Ministry of Defence on distributed analytics and information science, and an Alan Turing Institute project on modelling the effects on distribution grids of the recharging of electric vehicles. Richard published over 70 papers and held six patents.

Richard collaborated widely with researchers around the world, and it has been striking to see the international reaction to his passing. He was a gentle and kind soul, modest and unassuming; the best of friends for many of us; generous and hospitable, delighted to share an ingenious new way of doing something. He had, as some of his American friends in particular have noted, a wonderfully dry sense of humour.

Richard's loss is felt deeply by all who knew him, but especially by his wife Helen and their two teenage children. He was a wonderful husband and father, much loved by his family, and found great enjoyment in spending time with them. It is of some consolation for them to know that Richard was so well-respected and esteemed by fellow researchers around the world. He made many influential scientific contributions but will also be fondly remembered for his exceptional kindness and gentle demeanour.

Frank Kelly, Debasis Mitra and Ilze Ziedins

Table of Contents

IFIP Performance 2018

Keynote talk: Leandros Tassiulas

- **Optimizing the network edge for flexible service provisioning.....1**

Session 1: Parallel servers

- **Delay Asymptotics and Bounds for Multi-Task Parallel Jobs.....2**
  Weina Wang (University of Illinois at Urbana-Champaign), Mor Harchol-Balter (Carnegie Mellon University), Haotian Jiang (Tsinghua University), Alan Scheller-Wolf (Carnegie Mellon University), R. Srikant (University of Illinois at Urbana-Champaign)
- **SRPT for Multiserver Systems.....8**
  Isaac Grosof (Carnegie Mellon University), Ziv Scully (Carnegie Mellon University), Mor Harchol-Balter (Carnegie Mellon University)
- **Flexible Load Balancing with Multi-dimensional State-space Collapse: Throughput and Heavy-traffic Delay Optimality.....10**
  Xingyu Zhou (The Ohio State University), Jian Tan (The Ohio State University), Ness Shroff (The Ohio State University)

Session 2: Models and Analysis of Novel Technologies I

- **Joint User Association, Content Caching and Recommendations in Wireless Edge Networks 12**
  Livia Elena Chatzieleftheriou (Athens University of Economics and Business), George Darzanos (Athens University of Economics and Business), Merkouris Karaliopoulos (Athens University of Economics and Business), Iordanis Koutsopoulos (Athens University of Economics and Business)
- **Hidden semi-Markov models for electricity load disaggregation 18**
  Yung Fei Wong (Monash University), Lachlan Andrew (Monash University), Y. Ahmet Şekercioğlu (Sorbonne Université)
- **Information Market for Web Browsing: Design, Usability and Incremental Adoption.....24**
  Arash Molavi Kakhki (ThousandEyes), Vijay Erramilli (Salesforce), Phillipa Gill (U. Mass Amherst), Augustin Chaintreau (Columbia University), Konstantina Papagiannaki (Google), Balachander Krishnamurthy (AT&T Research)

Session 3: Limiting regimes

- **Size Expansions of Mean Field Approximation: Transient and Steady-State Analysis.....25**
  Nicolas Gast (INRIA), Luca Bortolussi (University of Trieste), Mirco Tribastone (IMT School for Advanced Studies Lucca)
- **Degree-Greedy Algorithms on Large Random Graphs.....27**
  Paola Bermolen (Universidad de la República), Matthieu Jonckheere (University of Buenos Aires-Conicet), Federico Larroca (Universidad de la República), Manuel Saenz (University of Buenos Aires-Conicet)
- **A central limit theorem for a Markov-modulated infinite-server queue with batch Poisson arrivals and binomial catastrophes.....33**
  Moeko Yajima (Tokyo Institute of Technology), Tuan Phung-Duc (University of Tsukuba)

Session 4: Caching and storage

- **Weighted Fair Caching: Occupancy-Centric Allocation for Space-Shared Resources 35**
  Lianjie Shi (National University of Singapore), Xin Wang (National University of Singapore), Richard T. B. Ma (National University of Singapore), Y. C. Tay (National University of Singapore)
- **Worst-case Bounds and Optimized Cache on M^{th} Request Cache Insertion Policies under Elastic Conditions.....37**
  Niklas Carlsson (Linkoping University), Derek Eager (University of Saskatchewan)
- **WOJ: Enabling Write-Once Full-data Journaling in SSDs by Using Weak-Hashing-based Deduplication.....39**
  Fan Ni (University of Texas at Arlington), Xingbo Wu (University of Texas at Arlington), Weijun Li (Shenzhen Dapu Microelectronics Co. Ltd, Shenzhen, China), Lei Wang (Beihang University), Song Jiang (University of Texas at Arlington)

Session 5: Network economics

- **Efficiency of High Playing Rates in Best Response Dynamics 41**
  Stephane Durand (INRIA), Federica Garin (INRIA), Bruno Gaujal (INRIA)
- **Auction mechanisms for Licensed Shared Access: reserve prices and revenue-fairness tradeoffs.....43**
  Ayman Chouayakh (Orange), Aurélien Bechler (Orange), Isabel Amigo (IMT Atlantique), Loutfi Nuaymi (IMT Atlantique), Patrick Maillé (IMT Atlantique)
- **Towards an Efficient Market Mediator for Divisible Resources 49**
  Mao Zou (University of Science and Technology of China), Richard T.B. Ma (National University of Singapore), Yinlong Xu (University of Science and Technology of China)

Keynote talk: Patrick Thiran

- **Locating the Source of Diffusion in Large-scale and Random Networks 51**

Session 6: Scheduling and resource sharing

- **Temporal starvation in multi-channel CSMA networks: an analytical framework 52**
  Alessandro Zocca (California Institute of Technology)
- **The Mean-field Behavior of Processor Sharing Systems with General Job Lengths Under the SQ(*d*) Policy 54**
  Thirupathaiah Vasantam (University of Waterloo), Arpan Mukhopadhyay (EPFL), Ravi R. Mazumdar (University of Waterloo)
- **Minimal-variance distributed deadline scheduling in a stationary environment 56**
  Yorie Nakahira (California Institute of Technology), Andres Ferragut (Universidad ORT Uruguay), Adam Wierman (California Institute of Technology)

Session 7: Models and Analysis of Novel Technologies II

- **Achieving fairness for EV charging in overload: a fluid approach 62**
  Martin Zeballos (Universidad ORT Uruguay), Andres Ferragut (Universidad ORT Uruguay), Fernando Paganini (Universidad ORT Uruguay)
- **Fairness in Online Social Network Timelines: Measurements, Models and Mechanism Design 68**
  Eduardo Hargreaves (UFRJ), Claudio Agosti (University of Amsterdam), Daniel Sadoc Menasché (UFRJ), Giovanni Neglia (Inria), Alexandre Reiffers-Masson (Indian Institute of Science), Eitan Altman (Inria)
- **Hierarchical Beamforming: Resource Allocation, Fairness and Flow Level Performance 70**
  Julien Floquet (Orange Labs), Richard Combes (Centrale-Supelec), Zwi Altman (Orange Labs)

Session 8: Redundancy Models

- **Delta probing policies for redundancy 72**
  Youri Raaijmakers (Eindhoven University of Technology), Sem Borst (Eindhoven University of Technology), Onno Boxma (Eindhoven University of Technology)
- **Analysis of Redundancy(d) with Identical Replicas 74**
  Tim Hellemans (University of Antwerp), Benny Van Houdt (University of Antwerp)
- **On a unifying product form framework for redundancy models 80**
  Urtzi Ayesta (CNRS & Ikerbasque-EHU), Tejas Bodas (CNRS, LAAS), Ina Maria Verloop (CNRS, IRIT)

Workshop ePerf: Performance and Modelling of Energy Systems

Session 1:

- **Highlight Talk on Battery Modeling: Trade-offs between Accuracy and Complexity 82**
  Catherine Rosenberg (University of Waterloo)
- **Leveraging Sparsity in Distribution Grids: System Identification and Harmonic State Estimation 84**
  Omid Ardakanian (University of Alberta)
- **State Estimation in the Power Distribution System 86**
  Dominik Danner, Hermann de Meer (University of Passau)

Session 2:

- **Congestion Avoidance in Low-Voltage Networks by using the Advanced Metering Infrastructure 89**
  Benoit Vinot (Schneider-Electric), Florent Cadoux (Grenoble INP), Nicolas Gast (Inria)
- **A Primal-Dual Gradient Method for Time-Varying Optimization with Application to Power Systems 92**
  Yujie Tang (Caltech), Emiliano Dall'Anese (University Colorado), Andrey Bernstein (NREL), Steven Low (Caltech)

Workshop PESN: Performance evaluation of satellite networks

Session 1:

- **Satellite Air Interface Evolutions in the 5G and IoT Era 93**
  Nader Alagha (ESA)
- **Aggregation of MQTT Topics: performance study over integrated satellite-terrestrial networks 96**
  M.R. Palattella (Luxembourg Institute of Science and Technology), R. Soua (University of Luxembourg), A. Stemper (University of Luxembourg), T. Engel (University of Luxembourg)
- **Seamless handover for video streaming over an SDN-based Aeronautical Communications Network 98**
  Doanh Luong (University of Bradford), Muhammad Ali (University of Bradford), Fouad Benamrane (University of Bradford), Ibrahim Ammar (University of Bradford), Yim-Fun Hu (University of Bradford)
- **Interference Management Schemes for High Spectral Efficiency Satellite Communications 100**
  Joan Bas (CTTC), Marius Caus (CTTC), Ana Pérez (CTTC), Reza Soleymani (University of Concordia), Nazli Khanbeigi (University of Concordia)

Session 2:

- **Link Quality Optimization for Hybrid LEO-GSO Constellations..... 104**
  Ángeles Vázquez-Castro (Autonomous University of Barcelona) and Julio A. Medina-Caballero (Autonomous University of Barcelona)
- **Securing Emergency Communications for the Next-Generation Networks: Performance Analysis of Centralised and Distributed Trust computing for future emergency communications. 108**
  Philip Asuquo (University of Surrey), Haitham Cruickshank (University of Surrey), C.P.A. Ogah (University of Surrey)
- **Research trends in SATCOM..... 112**
  Nicolas Kuhn (CNES)

Workshop SOCCA: Symposium on Cryptocurrency Analysis

Session 1:

- **[Keynote] Benchmarks and Models for Blockchain: Consensus Algorithms 113**
  Aad van Moorsel (Newcastle University)
- **Mining competition in a multi-cryptocurrency ecosystem at the network edge: a congestion game approach.....114**
  Eitan Altman (INRIA and Bell Labs Joint Lab), Mandar Datar (INRIA and Bell Labs Joint Lab), Daniel Sadoc Menasché (UFRJ), Alexandre Reiffers-Masson (Indian Institute of Science, Corinne Touati (INRIA) and Swapnil Dhamal (INRIA).
- **DAGsim: Simulation of DAG-based distributed ledger protocols.....118**
  Manuel Zander (Imperial College London), Tom Waite (Imperial College London) and Dominik Harz (Imperial College London)
- **Learning Blockchain Delays: A Hybrid Queueing Theoretic and Machine Learning Approach.....122**
  Saulo Ricci (CipherTrace), Alex Borges (UFJF), Daniel Menasche (UFJF, Artur Ziviani (LNCC) and Eduardo Ferreira (UFRJ)

Session 2:

- **[Keynote] On profitability of block withholding strategies 126**
  Ricardo Perez-Marco (CNRS, Univ. Paris-Diderot), joint work with Cyril Grunspan (ESILV)
- **Mine with it or sell it: the superhashing power dilemma 127**
  Francesco Bruschi (Politecnico di Milano), Vincenzo Rana (Politecnico di Milano), Lorenzo Gentile (Politecnico di Milano) and Donatella Sciuto (Politecnico di Milano)
- **What Drives Cryptocurrency Prices? An Investigation of Google Trends and Telegram Sentiment.....131**
  Nico Smuts (Imperial College London)
- **BlockSim: A Simulation Framework for Blockchain Systems.....135**
  Maher Alharby (Newcastle University) and Aad van Moorsel (Newcastle University)

Workshop WAIN: Workshop on AI in Networks

Session 1:

- **Feedforward Neural Networks for Caching: Enough or Too Much? 139**
  Vladyslav Fedchenko (INRIA), Giovanni Neglia (INRIA) and Bruno Ribeiro (Purdue University)
- **Robust URL Classification With Generative Adversarial Networks 143**
  Martino Trevisan (Politecnico di Torino) and Idilio Drago (Politecnico di Torino)
- **DeepSec meets RawPower - Deep Learning for Detection of Network Attacks Using Raw Representations 147**
  Gonzalo Marin (AIT Austrian Institute of Technology), Pedro Casas (AIT Austrian Institute of Technology) and Germán Capdehourat (IIE–FING, UDELAR, Uruguay)
- **MalAlert: Detecting Malware in Large-Scale Network Traffic Using Statistical Features..151**
  Michal Piskozub (University of Oxford), Riccardo Spolaor (University of Oxford) and Ivan Martinovic (University of Oxford)

Session 2:

- **Machine Learning Models for YouTube QoE and User Engagement Prediction in Smartphones 155**
  Sarah Wassermann (INRIA) , Nikolas Wehner (AIT Austrian Institute of Technology) and Pedro Casas (AIT Austrian Institute of Technology)
- **A Deep Learning Strategy for Vehicular Floating Content Management 159**
  Gaetano Manzo (HES SO Valais), Marco Ajmone Marsan (Politecnico di Torino and Institute IMDEA Networks), Sebastian Otalora Montenegro (HES SO Valais) and Gianluca Rizzo (HES SO Valais).
- **Learning Driven Mobility Control of Airborne Base Stations in Emergency Networks 163**
  Rui Li (The University of Edinburgh), Chaoyun Zhang (The University of Edinburgh), Razvan Stanica (INSA Lyon), Fabrice Valois (INSA Lyon) and Paul Patras (The University of Edinburgh).
- **On Runtime and Classification Performance of the Discretize-Optimize (DISCO) Classification Approach 167**
  Johan Garcia (Karlstad University) and Topi Korhonen (Karlstad University)
- **Distributed Learning in Ad Hoc Networks with Unknown Number of Players 171**
  Manjesh Kumar Hanawal (IIT Bombay) and Sumit J Darak (IIT Delhi).