22nd Conference on Innovation in Clouds, Internet and Networks

icin 2019

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22nd Innovation in Clouds, Internet and Networks

ICIN 2019

February 18-21, 2019
Paris, France

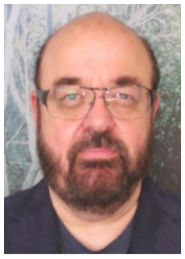
Program ICIN 2019

	Monday February 18, 2019		Tuesday February 19, 2019	Wednesday February 20, 2019	Thursday February 21, 2019
9:00	QoE	RINA	Tutorial 1: Intent-based Network Programmability	Keynote 1: Machine Learning/AI for Networking: myths and reality, a pragmatic approach	Keynote 3: Vertical Markets in IoT and the Digital Revolution
9:30					
10:00				Coffee break	Coffee break
10:30	Coffee break			TS3: Cloud Networks and Security	Keynote 4: Digital Twins, linking atoms to bits
10:45			Coffee break		
11:00	QoE	RINA			
11:15					
11:30			Tutorial 2: ETSI Open Source Mano: What it was, what it is, what it will be	Keynote 2: Wireless AI: Challenges and Opportunities	TS6: Software Defined Networking
12:45				Demo Session & Lunch Break	Demo Session & Lunch Break
13:00	Lunch Break		Lunch Break		
14:00	QoE	AIMLEM		TS4: Machine Learning and Network Intelligence	TS7: Enablers for Network Management
14:15			Opening Conference		
14:30			TS1: Mobile Edge Computing		
15:15					Coffee break
15:30	Coffee break			Coffee break	
15:45					Panel: Intelligence for IoT,0-Touch and New Networks
16:00	QoE	AIMLEM	Coffee break	TS5: Network and Service Orchestration	
16:30			TS2: Blockchain Technologies and Security		
16:45					Best Paper Awards & Closing Ceremony
17:30					
18:00					
18:30			Welcome Reception		
19:30				Conference Dinner	

Table of contents

Welcome Message from the Chairmans 3
ICIN 2019 Keynotes Speakers 4
ICIN 2019 Tutorial 1 6
ICIN 2019 Tutorial 2 6
ICIN 2019 Panel Session 7
ICIN 2019 Program - Tuesday, February 19 9
ICIN 2019 Program - Wednesday, February 20 10
ICIN 2019 Program - Thursday, February 21 11
QoE 2019 Keynote Speakers 12
RINA 2019 Keynote Speaker 12
AIMLEM 2019 Keynote Speaker 12
RINA 2019 Panel Session 13
QoE 2019 Program - Monday, February 18 14
RINA 2019 Program - Monday, February 18 15
AIMLEM 2019 Program - Monday, February 18 15
ICIN 2019 Venue 16
ICIN 2019 Dinner 16
ICIN 2019 Committee 17
Notes 20

Welcome Message from the Chairmans



Alex Galis
(UCL, UK)
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General Co-Chair

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(Ericsson, Netherlands)
TPC Co-Chair

Stefano Secci
(UPMC, France)
TPC Co-Chair

On behalf of the Organizing and Technical Program Committees, we are pleased to welcome you to the 22nd International Conference on Innovation in Clouds, Internet and Networks (ICIN 2019), which is being held on 18-21 February 2019, in Paris, France.

ICIN, established in 1989, is praised for the richness of its social and technical networking, and is widely recognized for its continuous adaptation to emerging technical trends, attracting numerous quality contributions and relevant actors and players from Industry and Academia.

5G is becoming a reality in 2019 with first commercial cellular networks deployments throughout the world. Virtualization and Softwarization play a crucial role in 5G networks and open the door to a higher level of programmability, thus enabling the introduction of intelligence and autonomicity in communication networks. Following the ICIN 2018 conference dedicated to 5G, the ICIN 2019 edition is dedicated to the challenges related to the integration of the intelligence and orchestration in the operation of networks, supported by experimental validation and proof of concepts.

As such the main theme of ICIN 2019 is
"***Network AI and Zero-Touch Communication Systems***"

This year, the conference program combines novel approaches and advanced technical solutions, illustrated by validation and proofs of concepts. ICIN 2019 will feature a high-quality technical program along with an exciting social event, including:

1. **Seven Technical Sessions** – providing the latest advances in their respective themes that are based on selected peer-reviewed papers (67 submitted papers with 31.3% acceptance rate for full papers; 6 additional papers accepted as short papers).
2. **Four keynote presentations** – Three keynotes will shed light on various aspects of intelligence in networks and associated challenges from a theoretical as well as practical point of view and from the physical layer up to orchestration. One keynote will present the role of IoT with respect to vertical markets and the digital revolution.
3. **One Panel Session** – specially dedicated to the specific issue of Network AI and Zero-Touch Communication Systems, gathering actors from Academia and Industry.
4. **Two-day Demo Sessions** – 4 demonstrations featuring proof-of-concept on a diverse and complementary set of technologies targeting the design and implementation of innovative models for virtual resources and softwarized network management and resilience; Edge and Fog Computing for Smart Home and IoT applications, all showcasing novel usage and business models in 5G environments.
5. **Three Workshops:**
    1. ***QoE MANAGEMENT***- the 3rd International Workshop on QoE management
    2. ***RINA*** - 6th International Workshop on the Recursive InterNetwork Architecture
    3. ***AIMLEN***- 1st International Workshop on Artificial Intelligence and Machine Learning Techniques for Enhanced Network Management.
6. **Two Tutorials** – one offers training on intent-based network programmability and the other on ETSI open source MANO.

We are delighted to organize ICIN 2019 in Paris, France's capital city which has, needless to say, a lot to offer in various ways. The conference is being held in Espace Hammelin near the Champs Elysées at the heart of the city. We are looking forward to making your participation in ICIN 2019 a memorable experience, from both professional and personal perspectives.

We are grateful to the many people who have been deeply involved in ICIN 2019: first, we acknowledge the numerous contributions of authors who submitted papers and demos. Second, we thank the Organizing Committee members who committed their time and expertise to enable and manage different parts of the conference, the TPC members and reviewers who provided guidance in the topics of the event and allowed us to set up an excellent technical program, Noël Crespi and the IAB members for their continuous support and the workshop organizers who helped us complementing the conference technical program.

Our special thanks go all the members of the organizing committee: Kurt Tutschku for organizing tutorials, Bruno Chatras and Tobias Hossfeld for co-organizing workshops, Roberto Minerva and Jérémie Legay for the keynotes and the panel, Amina Boubendir and Francesco Tusa for the demos, Filip Idzikowski and Müge Sayit for taking care of the proceedings, Elia Kallas for reactively maintaining the website and, above all to Aziza Lounis, for her dedication in all aspects of the conference.

Last but not least, we are grateful to our patrons for their generosity: Huawei, Orange, Nokia, Gandi and Sorbonne University and, as well as the efficient support of our technical sponsors: IEEE ComSoc and ACM SIGMOBILE.

We are looking forward to meeting you in person here at ICIN 2019 to discuss the latest advances in intelligence in networks and associated challenges.

Welcome to Paris and enjoy ICIN 2019.

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ICIN 2019 Keynote Speakers

JP Vasseur

(CISCO, France)

"Machine Learning/AI for Networking: myths and reality, a pragmatic approach"

JP Vasseur, PhD is a Cisco Fellow and lead of an engineering team developing products where he has been working on a number of networking technologies such as IP/MPLS, Quality of Service, Traffic Engineering, network recovery, PCE, "Internet of Things" (as the Chief Architect), Security, Wireless Networks since he joined Cisco in 1998. From 1992 to 1998, he worked for Service Providers in large multi-protocol environments, with a key focus on bringing cutting-edge innovation in shipping products.

JP has been an active member of the Internet Engineering Task Force (co-author of more than 35 IETF RFCs, funders and co-chair of several Working Groups such as the PCE and ROLL WG), and in several SDOs.

Since 2010, JP has been leading world class engineering teams of advanced networking and Analytics/Machine Learning (Self Learning Networks, Cloud-based Machine Learning) with key applications such as Security, network cognitive and predictive analytics for Enterprise Networks (wireless, LAN, WAN). JP is a regular speaker at various international conferences, he is involved in various research projects and the member of a number of Technical Program Committees. JP Vasseur is also Associate Professor at Telecom Paris.

He is the (co)inventor of more than 500 patents in the area of IP/MPLS, Security, The Internet of Things and Machines Learning / Analytics (#1 inventor at Cisco), with large impact in Internet Technologies.

He is the coauthor of "Network Recovery" (Morgan Kaufmann, July 2004), "Definitive MPLS Network Designs" (Cisco Press, March 2005) and "Interconnecting Smart Object with IP: The Next Internet (Morgan Kaufmann, July 2010 - http://www.thenextinternet.org/).

JP received a PhD in Networking (Mines-Telecom Paris – France, a Master of Science in Computer Science (Steven - USA) and an engineering degree in computer Science (France).

Abstract: *Networking technologies have been fast evolving over the past two decades leading to a broad range of technologies (numerous PHY/MACs, routing, QoS, high availability, security, ...) while requiring increasingly stringent requirements (from best effort to deterministic). Advanced analytics with Machine Learning is already playing a key role in today's networks, a trend that will undoubtedly increase very quickly in the coming years. That being said, the gap between what is being claimed in research papers and implementable at scale in commercial products keeps increasing, at the risk of disillusions in a near future. This talk will take a pragmatic approach sharing almost decade of experience implementing ML/AI product for networking, beyond "Proof of Concepts". Several breakthrough networking ML/AI applications (IoT, Wireless/Wired networks) will be discussed, providing fascinating results. The last part will be dedicated to the main challenges implementing ML/AI.*

Merouane Debbah

(HUAWEI, France)

"Wireless AI: Challenges and Opportunities"

Mérouane Debbah, is a Full Professor at CentraleSupelec (Gif-sur-Yvette, France) and the Director of the Mathematical and Algorithmic Sciences Lab, Huawei. His research interests lie in fundamental mathematics, algorithms, statistics, information & communication sciences research.

He is an IEEE Fellow, a WWRF Fellow and a member of the academic senate of Paris-Saclay. He is a leading researcher in wireless communications and recipient of several prestigious awards. Mérouane Debbah entered the Ecole Normale Supérieure Paris-Saclay (France) in 1996 where he received his M.Sc and Ph.D. degrees respectively.
He worked for Motorola Labs (Saclay, France) from 1999-2002 and the Vienna Research Center for Telecommunications (Vienna, Austria) until 2003. From 2003 to 2007, he joined the Mobile Communications department of the Institut Eurecom (Sophia Antipolis, France) as an Assistant Professor. Since 2007, he is a Full Professor at CentraleSupelec (Gif-sur-Yvette, France).

From 2007 to 2014, he was the director of the Alcatel-Lucent Chair on Flexible Radio. Since 2014, he is the director of the Mathematical and Algorithmic Sciences Lab.

Abstract: *Mobile cellular networks are becoming increasingly complex to manage while classical deployment/optimization techniques are cost-ineffective and thus seen as stopgaps. This is all the more difficult considering the extreme constraints of 5G networks in terms of data rate (more than 10 Gb/s), massive connectivity (more than 1,000,000 devices per km2), latency (under 1ms) and energy efficiency (a reduction by a factor of 100 with respect to 4G network). Unfortunately, the development of adequate solutions is severely limited by the scarcity of the actual resources (energy, bandwidth and space). Recently, the community has turned to a new resource known as Artificial Intelligence at all layers of the network to exploit the increasing computing power afforded by the improvement in Moore's law in combination with the availability of huge data in 5G networks. This is an important paradigm shift which considers the increasing data flood/huge number of nodes as an opportunity rather than a curse. In this talk, we will discuss through various examples how the recent advances in big data algorithms can provide an efficient framework for the design of Next Generation Intelligent Networks.*

Adam Drobot

(IEEE IoT initiative, USA)

"Vertical Markets in IoT and the Digital Revolution"

Adam T. Drobot, is a technologist with management expertise and more than 40 years of experience with business, government, and academia. Today his activities include strate-gic consulting, start-ups, and participation in industry associations and government advisory bodies. Previously he was the President of the Applied Research and Government Business Units at Telcordia Technologies, and the company's CTO from 2002 to 2010. Prior to that, Adam managed the Advanced Technology Group at Science Applications International Corporation (SAIC).
He also served as Senior Vice President for Science and Technology as part of his 27 years of service at SAIC from 1975 to 2002. He has published more than 100 journal articles, and is a frequent contributor to industry literature. He currently holds 21 patents. Adam is the 2007 recipient of IEEE's Managerial Excellence Award. He holds a B.S. in Engineering Physics from Cornell University and a Ph.D. in Plasma Physics from the Uni- versity of Texas. He is currently a member of several corporate boards and the FCC Technology Advisory Council, and he chairs the TIA's Board Technology Committee.

Abstract: *The trend towards digitization of products, services, and processes is challenging the notion and intuition of what Networks are, and how we should think about them. One manifestation, as seen in practical IoT solutions and applications, is the interweaving of technologies, domain knowledge, and operational principles from very different and dissimilar industries. Coincident with that is the dependence of the push towards digitization on essential general purpose infrastructure. This includes traditional utilities such as power and communications. It is, however, increasingly dominated by new widely available infrastructures for computing, data storage, sensing, actuation, operational interfaces, and software.*
The change over from tightly integrated single purpose vertical oriented solutions to reliance on shared building blocks offers great opportunities for innovation but at the same time creates a steep learning curve to achieve maturity. In this setting automation plays a central role in determining what will be successful and what will not. It defines the economics of operation at scale and for satisfying key requirements such as trust, security, privacy, reliability, availability, and the flexibility to accommodate vertical specific needs. Precursors of the ideas about automation in digitization and IoT offer some powerful lessons as do recent experiences that highlighting both successes and the difficulties encountered in actual deployments. Historical and recent examples from multiple Verticals will be used to illustrate the key points.

Roberto Saracco

(EIT ICT Labs, Italy)

"Digital Twins, linking atoms to bits"

Roberto Saracco, fell in love with technology and its implications long time ago. His background is in math and computer science.

Until April 2017 he led the EIT Digital Italian Node and then was head of the Industrial Doctoral School of EIT Digital up to September 2018.

Previously, up to December 2011 he was the Director of the Telecom Italia Future Centre in Venice, looking at the interplay of technology evolution, economics and society. At the turn of the century he led a World Bank-Infodev project to stimulate entrepreneurship in Latin America.

He is a senior member of IEEE where he leads the Industry Advisory Board within the Future Directions Committee and chairs the Symbiotic Autonomous Systems Initiative. He teaches a Master course on Technology Forecasting and Market impact at the University of Trento.

He has published over 100 papers in journals and magazines and 14 books, plus several ebooks. Among this latter there is one on Digital Twins, published on the iBook store in November 2018.

He writes a daily blog, http://sites.ieee.org/futuredirections/category/blog/, with commentary on innovation in various technology and market areas.

Abstract: *Digital Twins have been listed among the 10 most impactful emerging technologies of 2018. In a way they are already a well entrenched tech, being used by major companies like General Electric and Siemens, and have their roots going back at least to 15 years ago.*

At the same time they are a technology that is evolving fast and that will see a tremendous growth with adoption expanding to areas like healthcare and education, thus becoming a major force in the ongoing Digital Transformation.

The deployment of 5G will act as a catalyst further stimulating its growth.

The talk will address both the current status of digital twins as the foreseen evolution in tech and application, based on the studies made in the IEEE/FDC Symbiotic Autonomous Systems Initiative. Economic aspects as well as ethical and societal issues will also be addressed.

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ICIN 2019 Tutorial 1

"Intent-based Network Programmability"

Abstract: *The tutorial will introduce and explain the "intent-based" network programmability concept. Recently, network programmability received a lot of attention from both academia and industry, and the first ready-to-market solutions are now emerging. The concept of network programmability stems from the increasingly dominant role that software is playing in modern communication infrastructures, fostered by the unprecedented combination of several technological paradigms that evolved significantly in recent years, such as virtualization, Cloud Computing, Software Defined Networking, Network Operating System, Network Function Virtualization, etc. Similarly to what happened in the computing field, one of the most relevant key enablers to efficient network programmability will be the adoption of proper abstraction models. Abstractions will allow network operators and service providers to "think out of the box" and focus on high-level resource management and service description issues, instead of taking care of technology-specific and vendor-dependent details for network service deployment.*

The first goal of this tutorial is to provide an introduction to the enabling technologies, with particular emphasis on their role and interplay in determining current network programmable solutions. Once these concepts are clarified, the focus is moved to the service composition issue. To date, such operations have been performed by means of very specific programming interfaces, making network programmability a technically challenging task, especially in case of multi-vendor deployments. However, the need for a more user-friendly approach emerged, which allows specifying service description by means of abstractions closer to natural language expressiveness.

A solution to this problem that is currently gaining momentum is the so-called "intent-based" approach, that puts the focus on what we want to achieve instead of how to achieve it. The intent-based approach will be explained, with particular reference to the Open Networking Foundation (ONF) vision as a network programming abstraction. Then some case studies will be presented, mapped on the most relevant platforms that implement this functionality, such as ONOS. A short hands-on session will conclude the tutorial, to help the audience familiarizing with the practical aspects of intent-based network programming.

Franco Callegati
(University of Bologna, Italy)

Franco Callegati, is an associate professor of telecommunication networks at the University of Bologna, Italy. His research interests are in the field of teletraffic modeling and performance evaluation of telecommunication networks. He is currently working on performance evaluation and experimental validation of SDN/NFV-based networking solutions.He has been active in EU-funded research projects since FP4, where he led activities and participated in various steering committees.

Walter Cerroni
(University of Bologna, Italy)

Walter Cerroni is an assistant professor of communication networks at the University of Bologna, Italy. His most recent research interests include: definition, implementation, and performance evaluation of intent-based northbound interfaces for programmable SDN/NFV infrastructures; design, implementation, and performance evaluation of virtual network function chaining in cloud computing platforms (e.g. OpenStack); modeling and design of inter- and intra-data center interconnection networks for cloud computing infrastructures. He has contributed to several national and international research projects. Walter Cerroni is currently serving as Series Editor for IEEE Communications Magazine and Associate Editor for IEEE Communications Letters.

Chiara Contoli
(University of Bologna, Italy)

Chiara Contoli is a post-doc researcher at the University of Bologna, Italy, where she obtained her Ph.D. degree in 2017. She was a research scientist at the Network Research Laboratory of the University of California at Los Angeles, USA, where she worked on content delivery networks for automotive applications to complete her Master's thesis. In 2016 she was visiting the Computer Science Department at Saint Louis University, USA. Her research interests are in programmable networks, SDN, NFV, and more generally in advanced networking architectures.

ICIN 2019 Tutorial 2

"ETSI Open Source Mano: What it was, what it is, what it will be"

Abstract: *The tutorial that covers theoretical aspects on OSM and how it relates to ETSI NFV Architecture, as architecture and design principles, and main OSM features.*

Objective: Participants will learn the main aspects about the platform as well as the innovative new features in Release 5.

Tutorial outline:

- *Open Source Mano: Overview of Project Goals and Milestones, Current Status*
- *Innovative new features in*
- *Orchestrating a SFC-enabled SSL/TLS traffic processing architecture using MANO*
- *Network Slicing work for OSM*

Vanessa Little
(VMware , Canada)

With over 25 years' experience in various roles in network and system architecture, mobile video system architecture and governance in both telco and retail sectors, Van has developed a diverse toolset. Having worked as everything from UNIX sysadmin to Chief Technical Officer with a number of leadership roles in between, Van has contributed to technologies from mobile, enterprise data centre, multi-national networks and beyond. Now at VMware as the Director - Global NFV Ecosystem Architecture Van is focused on leading integrated architectures that incorporate NFV partners across the globe in useful NFV solutions that solve for specific problems. Aside from her role at VMware, Vanessa is also the current Technical Steering Committee Chair of the ETSI Open Source Mano project, as well as the founder of the VNF Onboarding open source project, bellhop. These role have her speaking at conferences around the world, and spreading the word about the strength of the NFV Ecosystem, and emerging technologies in the space.

ICIN 2019 Panel Session

" Intelligence for IoT,0-Touch and New Networks"

Abstract: *The Intelligence for IoT, 0-TOuch and New Network panel is devoted to discussing crucial topics of the ICT evolution and in particular the communications ones. Intelligence in this context can assume the form of more programmability of resources and the introduction of Artificial Intelligence tools and functions in order to help in the execution and management of resources. Heterogeneous resources can aggregate in different ways for supporting the communications needs of different applications domains (e.g., slicing, access to specific functions and the service execution in different cloud environments). In addition, the importance of edge resources will pose relevant issues to management and dynamic aggregation into efficient infrastructures at the edge. IoT and New Network are large applications fields that will need intelligence and 0-Touch solutions for their successful implementation and large scale deployment towards high number of resource constrained devices, multiplicity of service requirements, and new connectivity paradigms.*

A renowned group of experts will discuss these and more topics:

Roberto Minerva
(Telecom SudParis, France)

Roberto Minerva holds a Ph.D in Computer Science and Telecommunications from Telecom SudParis, France, and a Master Degree in Computer Science from Bari University, Italy. He was the Chairman of the IEEE IoT Initiative, an effort to nurture a technical community and to foster research in IoT. Roberto has been for several years in TIMLab, involved in activities on SDN/NFV, 5G, Big Data, architectures for IoT. Now he is a research engineer in Paris Sud Telecom and the Chief Technologist in Bitify.it, a startup aiming to drive the digitalization of businesses in several industries. He is authors of several papers published in international conferences, books and magazines. He has been an adjunct professor for three years at the Turin's Polytechnic teaching a course on Mobile Services. He has given several invited speeches in Conferences and he held several classes at universities and Conferences.

Rogier Noldus
(Ericsson, The Netherlands)

Rogier Noldus is principal solution architect at Ericsson Telecommunications. He has been actively involved in Intelligent Networks (IN) standardization and has driven the development of CAMEL within Ericsson. After the completion of the CAMEL standard, he has made a switch to IP multimedia system (IMS) and is now focusing on the integration of GSM/3G and IMS networks, including VoLTE and VoWifi, the evolution of IMS service architecture and the integration of Web Services. He holds a B.Sc. degree (electronics) from the Institute of Technology, Utrecht (Netherlands) and a M.Sc. degree (telecommunications) from Witwatersrand University, Johannesburg (South Africa). He joined Ericsson in 1996. Prior to that, Rogier started his career in South Africa, where he has worked for several companies, in the area of telecommunications. Rogier is (co)author of a number of books on IN and IMS and is a frequent presenter at conferences, as well the author of a large number of patents / patent applications in the area of IN, IMS, Fixed-mobile convergence and Network evolution.

Christian Destré
(Orange, France)

Christian Destré is currently leading the NFV/SDN orchestration technical studies of the Orange On-Demand Networks program, consolidating the NFV orchestration journey for Orange affiliates including the preparation for 5G network deployment. He was also involved in many research activities related to Autonomic Networking and network management for 10 years and was the technical manager of the EU FP7 UNIVERSELF project between 2010 and 2013.He received a PhD degree (computer science) from Université d'Evry (France) in 2004.

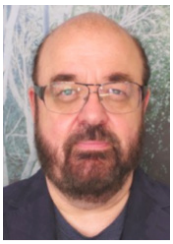
Paul J. Kuehn
(Universität Stuttgart, Germany)

Paul Kuehn received the Dr.-Ing. and Dr.-Ing.habil degrees from the University of Stuttgart and headed a research group on communication networks before he joined Bell Laboratories in Holmdel NJ in 1977. He was appointed full professor first at the University of Siegen and the University of Stuttgart in 1982 for Communication Networks and Computer Engineering, where he headed the Institute IKR for 28 years. He is the Founding Dean of the Faculty IET at the German University in Cairo (GUC) since 2002, member of the German National Academy Leopoldina, the Heidelberger Academy of Sciences and the German Technical Academy acatech. Professor Kuehn was Co-Chair of the EU Research Project on ATM from 1988-1994, Chairman of the German Research Society (DFG) Research Center Program on Mobile Communication from 1993-1998, Head of the DFG Graduate College Doctoral Program from 1993-2002, and Vice-Chair of the DFG Collabotative Research Center NEXUS at the University of Stuttgart from 2001 -2009. From 1991 to 2007 he was the Chairman of the Advisory Council of the International Teletraffic Congress (ITC), from 1995 – 2000 Chairman of the Advisory Board of the Center for Telematics and Information Technology (CTIT) at the University of Twente, NL, and since 2007 Chairman of the Advisory Board of the Institute of Information System Design (ITeG) at the University of Kassel, Germany. He published more than 150 technical papers and has been repeatedly Co-Editor of Special Issues of the IEEE Journal JSAC, the European Transactions on Telecommunications and AEÜ. He received the Chevallier Ordre Palmes Academiques from French Government for international science exchange, the Christo Columbus Gold Medal from the City of Genova for his contributions to Telecommunications, the Eduard-Rhein Price for pioneering work in Teletraffic Theory and Packet Switching, and the Arne-Jensen Lifetime Achievement Award of the ITC. He was awarded Dr.h.c. from the Lund Institute of Technology (Sweden) and Dr.-Ing.E.h. from the Technical University of Dresden, Germany. He is a Life Fellow of IEEE, Fellow of the German Information Technology Society (ITG), and Honorary Member of the German Electrotechnical Society (VDE).

His current research activities are on stochastic performance modeling and traffic engineering for communication network protocols and service integration, wireless access networks and the Future Internet core with applications to IoT, Cyber Physical Systems, and for energy efficient operation.

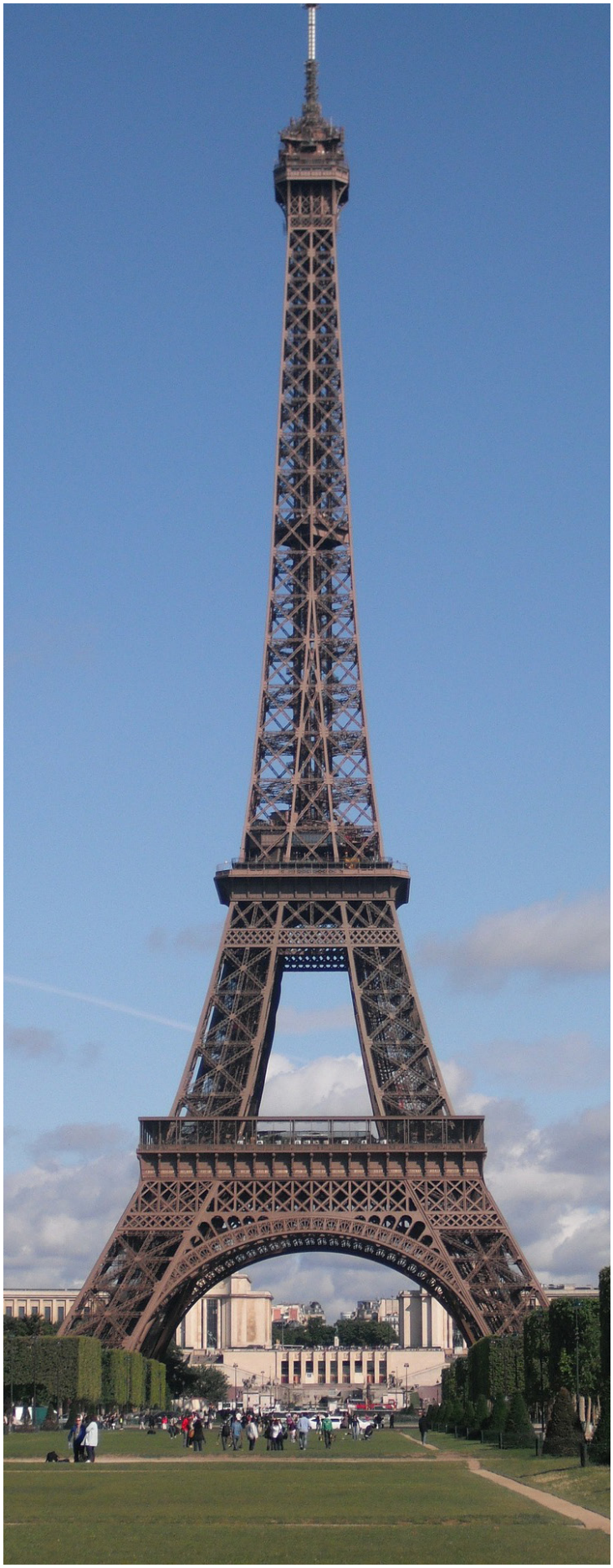
Adam Drobot
(IEEE IoT initiative, USA)

Adam T. Drobot is a technologist with management expertise and more than 40 years of experience with business, government, and academia. Today his activities include strate-gic consulting, start-ups, and participation in industry associations and government advisory bodies. Previously he was the President of the Applied Research and Government Business Units at Telcordia Technologies, and the company's CTO from 2002 to 2010. Prior to that, Adam managed the Advanced Technology Group at Science Applications International Corporation (SAIC).
He also served as Senior Vice President for Science and Technology as part of his 27 years of service at SAIC from 1975 to 2002. He has published more than 100 journal articles, and is a frequent contributor to industry literature. He currently holds 21 patents. Adam is the 2007 recipient of IEEE's Managerial Excellence Award. He holds a B.S. in Engineering Physics from Cornell University and a Ph.D. in Plasma Physics from the Uni- versity of Texas. He is currently a member of several corporate boards and the FCC Technology Advisory Council, and he chairs the TIA's Board Technology Committee.



Alex Galis
(University College London, UK)

Alex Galis is a Professor in Networked and Service Systems at University College London (UCL). His current interests are on 5G networking, software defined infrastructure and services, network and cloud programmability and management. He has co-authored more than 280 publications in the future Internet areas: networks and services, management, networking clouds, virtualization and programmability including 10 research books. He has contributed to ITU-T standards on Future Networks and 5G Networks and he has worked on IETF drafts in Autonomic networking and network slicing. He has been a co-principal investigator at UCL on a number of EU research projects with a total UCL budget of more than 10 M£, including overall technical leadership of the MISA - Management of IP networks, FAIN - programmable networks, CONTEXT - context aware networking, AUTONOMIC INTERNET - autonomic network and NECOS - Novel Enablers for Cloud Slicing projects. He was a member of the Steering Group of the Future Internet Assembly (FIA) and he led the Management and Service–aware Networking Architecture (MANA) working group at FIA. He acted as PTC/ keynotes/ panels/ workshops co-chair of 14 IEEE conferences including TPC co-chair of 1st IEEE Network Softwarization 2015 (NetSoft 2015, hosted by UCL in London) and reviewer in more than 100 IEEE conferences and journals. He is a co-editor of IEEE JSAC series on Network Softwarization and Enablers, ETRI Journal published by Wiley and of the IEEE Communications Magazine feature topic on Advances in Networking Software. He is an International Academy, Research, and Industry Association (IARIA) Fellow (2011, https://www.iaria.org/fellows.html). He was selected as a Vice Chair of the ITU-T SG13 Group on Future Networking. He is involved in IEEE SDN initiative including co-chairing of the IEEE SDN publication committee.



ICIN 2019 Program - Tuesday, February 19

09:00-10:45 Tutorial 1 - Intent-based Network Programmability
Franco Callegati, Walter Cerroni, Chiara Contoli (University of Bologna, Italy)
Session Chair: Prosper Chemouil (Orange Labs (retired), France)

10:45-11:15 Coffee Break

11:15-13:00 Tutorial 2 - ETSI Open Source Mano: What it was, what it is, what it will be
Vanessa Little (VMware , Canada)
Session Chair: Prosper Chemouil (Orange Labs (retired), France)

13:00-14:15 Lunch Break

14:15-14:30 Opening Conference

14:30-16:00 TS1 - Mobile Edge Computing
Session Chair: Franco Callegati (Univ. di Bologna, Italy)

Higher aggregation of gNodeBs in Cloud-RAN architectures via parallel computing
Veronica Quintuna and Fabrice M. Guillemin (Orange Labs, France)

ReSeT: Reducing the Service Disruption Time of Follow Me Edges over Wide Area Networks
Jin Jeong and Jaehee Ha (Korea Advanced Institute of Science and Technology (KAIST), Korea); Myungchul Kim (KAIST, Korea)

Enhanced Augmented Reality Applications in Vehicle-to-Edge Networks
Pengyuan Zhou (University of Helsinki, Finland); Wenxiao Zhang, Tristan Braud (The Hong Kong University of Science and Technology, Hong Kong); Pan Hui (Hong Kong University of Science and Technology & University of Helsinki); Jussi Kangasharju (University of Helsinki, Finland)

Semantic Service Gateway for ECHONET based Smart Homes
Cu Van Pham (Japan Advanced Institute of Science and Technology, JAIST, Japan); Yoshiki Makino (JAIST & National Institute of Information and Communications Technology, NICT, Japan); Yuto Lim (JAIST & School of Information Science, Japan); Yasuo Tan (JAIST & NICT, Japan)

16:00-16:30 Coffee Break

16:30-18:30 TS2 - Blockchain Technologies and Security
Session Chair: Stefano Secci (Cnam, France)

Towards a Performance Evaluation of Private Blockchain Frameworks using a Realistic Workload
Marcela Tuler de Oliveira, Gabriel R. Carrara, Natalia Fernandes, Celio Albuquerque, Ricardo C Carrano, Dianne Medeiros and Diogo Mattos (Universidade Federal Fluminense & MidiaCom, Brazil)

Addressing Multi-Stage Attacks Using Expert Knowledge and Contextual Information
Francisco Javier Aparicio Navarro (De Montfort University & Loughborough University, United Kingdom (Great Britain)); Timothy Ascus Chadza (Loughborough University, United Kingdom (Great Britain) & University of Malawi - The Polytechnic, Malawi); Konstantinos Kyriakopoulos, Ibrahim Ghafir and Sangarapillai Lambotharan (Loughborough University, United Kingdom (Great Britain)); Basil AsSadhan (King Saud University, Saudi Arabia)

Network Access Control for the IoT: A Comparison Between Cellular, Wi-Fi and LoRaWAN
Shanay Behrad, Stephane Tuffin and Emmanuel Bertin (Orange Labs, France); Noel Crespi (Institut Mines-Télécom, Télécom SudParis, France)

BALAdIN for blockchain-based 5G networks
Nathalie Omnes (Orange Labs, France); Gaël Fromentoux (Orange labs, France); Vincent Messié (IMT Atlantique & Orange, France); Xavier Marjou (Orange, France)

18:30 Welcome Reception

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ICIN 2019 Program - Wednesday, February 20

09:00-10:00 Keynote 1 - Machine Learning/AI for Networking: myths and reality, a pragmatic approach
JP Vasseur (CISCO, France)
Session Chair: Jeremie Leguay (Huawei Technologies, France)

10:00-10:30 Coffee Break

10:30-11:45 TS3 - Cloud Networks and Security
Session Chair: Fabrice M. Guillemin (Orange Labs, France)

Mitigating Reordering Vulnerability of MPTCP With Transparent Proxies
Tacettin Ayar (Technical University Berlin, Germany); Lukasz Budzisz (HPE Aruba, Germany); Berthold Rathke (TU Berlin, Germany)

Designing and Assessing Multi-tenant Isolation Strategies for Cloud Networks
Bruno Medeiros (École Normale Supérieure, France); Marcos A. Simplicio Jr. (University of São Paulo, Brazil); Ewerton Andrade(Instituto Federal de Rondônia, Brazil)

Detection of DDoS Attacks and Flash Events Using Shannon Entropy, KOAD and Mahalanobis Distance
Salva Daneshgadeh (Middle East Technical University & MAYCybertechnology, Turkey); Tarem Ahmed (Independent University, Bangladesh (IUB), Bangladesh); Thomas Kemmerich (Norwegian University of Science and Technology, Norway); Nazife Baykal (Middle East Technical University, Turkey)

11:45-12:45 Keynote 2 - Wireless AI: Challenges and Opportunities
Merouane Debbah (HUAWEI, France)
Session Chair: Rogier Noldus (Ericsson, Netherlands)

12:45-14:00 Demo Session & Lunch Break
Session Chair: Amina Boubendir (Orange Labs, France)

Designing and Implementing Resilient IoT Applications in the Fog: A Smart Home Use Case
Umar Ozeer, Loic Letondeur and François-Gaël Ottogalli (Orange Labs, France); Gwen Salaün and Jean-Marc Vincent (University Grenoble Alpes, CNRS, Inria, LIG, France)

An Integrated SLA Management Framework in a 5G Environment
Marios Touloupou, Evgenia Kapassa, Chrysostomos Symvoulidis, Panagiotis Stavrianos and Dimosthenis Kyriazis (University of Piraeus, Greece)

COWShED: Communication within white spots for breeders
Madoune Robert Seye and Moussa Diallo (UCAD, Senegal); Bamba Gueye (Université Cheikh Anta Diop de Dakar, Senegal)

An Artificial Intelligence Enabled Data Analytics Platform for Digital Advertisement
Naz Albayrak and Aydeniz Özdemir (Turk Telekomunikasyon A. S., Turkey); Engin Zeydan (CTTC, Spain)

14:00-15:30 TS4 - Machine Learning and Network Intelligence
Session Chair: Stefano Secci (Cnam, France)

Mobile Traffic Anonymization Through Probabilistic Distribution
Louma Chaddad, Ali Chehab, Imad H Elhajj and Ayman Kayssi (American University of Beirut, Lebanon)

Sparse Regression Model to Predict a Server Load for Dynamic Adjustments of Server Resources
Takaya Miyazawa, Hiroaki Harai, Yusuke Yokota and Yasushi Naruse (National Institute of Information and Communications Technology, Japan)

Next-cell Prediction Based on Cell Sequence History and Intra-cell Trajectory
Meysam Goodarzi (IHP - Leibniz-Institut für Innovative Mikroelektronik & Humboldt University of Berlin, Germany); Jesús Gutiérrez, Vladica Sark and Nebojsa Maletic (IHP, Germany); Eckhard Grass (IHP & Humboldt-University Berlin, Germany)

A Predictive Approach for Managing Network Port Resources of Service Providers
Feyzullah Kalyoncu (Bogazici University, Turkey); Engin Zeydan (CTTC, Spain); Ahmet Yildirim (Bogazici University, Turkey)

15:30-16:00 Coffee Break

16:00-18:00 TS5 - Network and Service Orchestration
Session Chair: Amina Boubendir (Orange Labs, France)

Combined Degree-Based with Independent Dominating Set Approach for Controller Placement Problem in Software Defined Networks
Abdunasser Alowa and Thomas Fevens (Concordia University, Canada)

An Autonomous Service-Oriented Orchestration Framework for Software Defined Mobile Networks
Xuan-Thuy Dang (TU Berlin & DAI Labor, Germany); Manzoor Ahmed Khan (TU Berlin, Germany); Fikret Sivrikaya (GT-ARC gGmbH & TU Berlin, Germany)

Topology Discovery Performance Evaluation of OpenDaylight and ONOS controllers
Mamadou Tahirou Bah, Abdelhadi Azzouni, Thi Mai Trang Nguyen and Guy Pujolle (Sorbonne University, France)

Layered Solutions for Dynamic Service Chaining
Zoltán Zsóka and Khalil Mebarkia (Budapest University of Technology and Economics, Hungary

Wormhole: a novel big data platform for 100 Gbit/s network monitoring and beyond
Rafael Leira Osuna, Lluis Gifre Renom, Ivan Gonzalez, Jorge E. López de Vergara and Javier Aracil (Universidad Autonoma de Madrid, Spain)

Design and Implementation of Tracking System for Moving Objects in Information-Centric Networking
Tatsuya Tanaka, Suyong Eum , Shingo Ata and Masayuki Murata (Osaka University, Japan)

19:30 Conference Dinner

ICIN 2019 Program - Thursday, February 21

09:00-10:00 Keynote 3 - Vertical Markets in IoT and the Digital Revolution
Adam Drobot (IEEE IoT initiative, USA)
Session Chair: Roberto Minerva (IMT, France)

10:00-10:30 Coffee Break

10:30-11:30 Keynote 4 - Digital Twins, linking atoms to bits
Roberto Saracco (EIT ICT Labs, Italy)
Session Chair: Noel Crespi (IMT, France)

11:30-12:45 TS6 - Software Defined Networking
Session Chair: Alex Galis (University College London, United Kingdom)

BBGDASH: A Max-Min Bounded Bitrate Guidance for SDN Enabled Adaptive Video Streaming
Ali Alissa (University of Plymouth, United Kingdom); Abdelhak Bentaleb (National University of Singapore, Singapore); Thomas Zinner (TU Berlin, Germany); Bogdan Ghita (University of Plymouth & Centre for Security, Communications, and Network Research, United Kingdom); Is-Haka Mkwawa (University of Plymouth, United Kingdom)

SDN Controller Requirements for Next Generation Telco PaaS
Angelos Mimidis and Jose Soler (Technical University of Denmark, Denmark); Fernando Diaz (ATOS, Spain); Aurora Ramos (Atos, Spain); Olivier Choisy (BCOM, France); Gopalasingham Aravinthan (Nokia Bell Labs, France)

Paving the Way towards Enterprise SDN Adoption: New Selection Strategies for Hybrid Networks
Osamah Lutf Hamood Barakat, Tayyebe Emadinia, David Koll and Xiaoming Fu (University of Goettingen, Germany)

12:45-14:00 Demo Session & Lunch Break
Session Chair: Stuart Clayman (UCL, UK)

Privacy matters ?
Aymeric Barantal (Gandi SAS, France)

Cooperative AI-based e2e Network Slice Scaling
Makram Bouzid, Duc Hung Luong, Dimitre Kostadinov, Yue Jin, Lorenzo Maggi, Abdelkader Outtagarts, and Armen Aghasaryan (Nokia Bell Labs, France)

Next Generation Platform as a Service: the 5G use-case
Bilal Al Jammal, Lionel Natarianni, Bessem Sayadi (Nokia Bell Labs, France)

14:00-15:15 TS7 - Enablers for Network Management
Session Chair: Diogo Mattos (Universidade Federal Fluminense, Brazil)

Using the Total Cost of Ownership to Decide Resource Adjustment in Virtual Networks
Pedro Martinez-Julia and Ved P. Kafle (National Institute of Information and Communications Technology, Japan); Hitoshi Asaeda(National Institute of Information and Communications Technology (NICT), Japan)

Optimal Cache Budget Distribution for Hierarchical ICN Networks
Dwight Makaroff and Alireza Montazeri (University of Saskatchewan, Canada)

Non-Orthogonal Multiple Access for Cognitive Mobile Radio Networks in 5G Communications
Pablo Palacios (Universidad de Chile, Ecuador); Milton Román (Universidad de Las Américas, Ecuador); Carlos Saavedra (Escuela Superior Politécnica del Litoral, Ecuador); José Julio Freire (Universidad de Las Américas, Ecuador)

15:15-15:45 Coffee Break

15:45-16:45 Panel - Intelligence for IoT,0-Touch and New Networks

The Intelligence for IoT, 0-TOuch and New Network panel is devoted to discussing crucial topics of the ICT evolution and in particular the communications ones. Intelligence in this context can assume the form of more programmability of resources and the introduction of Artificial Intelligence tools and functions in order to help in the execution and management of resources. Heterogeneous resources can aggregate in different ways for supporting the communications needs of different applications domains (e.g., slicing, access to specific functions and the service execution in different cloud environments). In addition, the importance of edge resources will pose relevant issues to management and dynamic aggregation into efficient infrastructures at the edge. IoT and New Network are large applications fields that will need intelligence and 0-Touch solutions for their successful implementation and large scale deployment towards high number of resource constrained devices, multiplicity of service requirements, and new connectivity paradigms.

A renowned group of experts will discuss these and more topics:

Moderator: Roberto Minerva (Telecom SudParis, France)

Alex Galis (University College London, UK)
Paul Kuehn (Universität Stuttgart, Germany)
Adam Drobot (IEEE IoT initiative, USA)
Christian Destre (ORANGE, France)
Rogier Noldus (Ericsson, Netherlands)

16:45 Best Paper Awards & Closing Ceremony

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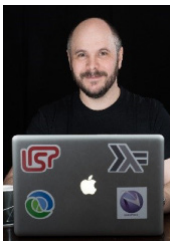
QoE 2019 Keynote Speakers



Martín Varela

(callstats.io, Finland)

"Some things we might have missed along the way"

Martín Varela has over 16 years of QoE research background. He received his PhD from the Université de Rennes 1, France, in 2005, and has since worked both in academia (most recently in VTT, Finland, where he was a Principal Scientist, leading research on QoE), and nowadays in the industry, trying to figure out the intricacies of quality for WebRTC applications at callstats.io.

Abstract: *There is currently a non-trivial gap between research on QoE and QoE management, as conceived by the research community, and the actual practices in the industry. As a result, much of our ideas, while good on paper, don't get to be applied in the wild. There are numerous reasons for this, and in this talk, I will cover some of them, along with potential solutions. In particular, I will cover some issues I've observed in the context of WebRTC monitoring. The goal is to inspire QoE researchers — in particular those interested in QoE management — to try and shift their perspective, so that it is better aligned with the realities of the industry.*

Dario Rossi

(Huawei Technologies, France)

"Human in the QoE loop (aka the Wolf in Sheep's clothing)"

Dario Rossi is Chief Expert on Network AI at Huawei Technologies, co. Ltd. He holds an HDR from UPMC (2010), as well as a PhD (2005) and MSc (2001) degrees from Politecnico di Torino. Before joining Huawei in 2018, he occupied a Chair Professor (2016-2018), Full Professor (2012-2016) and Associate Professor (2006-2012) positions at the Computer Science and Networking department of Telecom ParisTech. He was also a Professor at the LIX department of Ecole Polytechnique (2012-2018). Prior to that, he worked with the Telecommunication Network Group of the Electrical Engineering department at Politecnico di Torino (2001-2006) and held a Visiting Researcher position in the Computer Science division at University of California, Berkeley (2003-2004).

He co-chaired the RT2, that federates the Institut Mines-Telecom researchers working on the networking domain (about 50 people from 5 schools in France), presently serves in the Steering committees of ITC and AINTEC, chaired ACM ICN (2016), the last 2 editions of ACM SIGCOMM AINTEC (2013,2014) and of the ACM SIGCOMM PhD School on Traffic Monitoring and Analysis (2014,2018) and participated in the program committees of 50+ conferences including IEEE INFOCOM, ACM CoNEXT and ACM SIGCOMM. He has coauthored 8 patents and 150+ papers in leading conferences (including IEEE INFOCOM, ACM SIGCOMM, ACM CoNEXT, ACM IMC and WWW) and journals (including IEEE JSAC, ACM/IEEE TON, ACM CCR, IEEE TMM) that attracted over 5000 citations (Google scholar) and received 6 best paper awards. He is Senior Member of IEEE (2013) and ACM (2015), received an IETF Applied Network Research Prize (2016), a Google Faculty Research Award (2015), and has been honored with Distinguished Member recognition from the INFOCOM TPC (2015, 2016, 2017). His current research interest include Machine learning, Internet traffic measurement, and high speed all-sofware networking, whereas previous interests included congestion control, Information centric networks, green networking, peer-2-peer networks, traffic engineering and vehicular networks.

Abstract: *The ecosystem of Internet and enterprise network applications has always been changing at a very fast pace: as applications are essentially pieces of software, this allow the fast introduction of new killer applications in the ecosystem, the extinction of others, and a continuous evolution of the remaining ones. As the ultimate goal of any application is to offer some kind of entertainment or a business service to its end users, the objective measurement of the quality of experience (QoE) delivered to the users has been a quite active research field. From the network viewpoint, an accurate measurement of the user QoE empowers the infrastructure with the ability to more effectively control the usage, and better arbitrate the sharing, of its available resources: going beyond QoS management, which can at most improve network efficiency, QoE management allows to improve the benefits perceived by its user.*

While QoE-driven network management is a desirable objective, it also raises significant challenges. Clearly, QoE management can improve over classic QoS management only as long as the QoE inference process is accurate. However QoE inference is complex due to continuous protocol evolution, application changes and related trends such as traffic encryption, etc. As such, the use of techniques such as machine learning to let define data-driven QoE models is as appealing as it is challenging. One of these reasons lays in the fact that QoE estimation need to involves humans in the learning loop, to provides useful ``labels" as input to the learning algorithm. The process to collect these labels is cumbersome, and exposed to a range of human behaviors -- that can seldom be described with adjectives as unexpected, random, funny, counter-intuitive, adversarial. Yet, humans are key in this QoE loop, of which they are both the starting point, as well as the ultimate goal.

In this keynotes, we discuss these challenges taking an ever-green Internet application (namely, Web browsing) as the main leitmotiv and to provide examples of practical relevance.

RINA 2019 Keynote Speaker

Philippe Poux

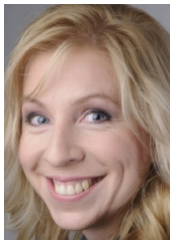
(Startdoon, Armenian)

"The RINArmenia initiative"

Philippe Poux General Manager with a real passion for New Technologies and their Marketing side. And a very bright mix with Contextor that helps many companies to enrich their customer experience without focusing on annoying tasks.
Love to help people develop 2.0 projects and involved in some like HURIKAT or WeDoApps ...
Also member of Forum Atena, teacher at ECE, founder of VocalExpo, the first major event on Speech Technologies in France and MobilePaymentExpo, an international event about Mobile and Money !

Abstract: *This talk will introduce the goals of the RINArmenia initiative, a partnership between the Armenian government and private entrepreneurs. RINArmenia has the long-term goal of deploying RINA-based technology as an alternative to the current Internet; first in Armenia and later expanding through the world. Over the coming months a group of scientists and researchers will be formed in Armenia to operate the new computer network architecture and launch it through the country.*

AIMLEM 2019 Keynote Speaker



Elena Fersma

(Ericsson, Sweden)

"Intelligent Network Operations with Artificial Intelligence"

Elena Fersma is a Research Director in Artificial Intelligence at Ericsson. She is responsible of a team of 100+ researchers located in Sweden, US, India, Hungary and Brazil. She is also a docent and an adjunct professor in Cyber-Physical Systems specialized in Automation at the Royal Institute of Technology in Stockholm. She holds a PhD in computer science from Uppsala University, a Master in Management from St. Petersburg Polytechnic University and did a postdoc at École Normale Supérieure Paris-Saclay. At Ericsson, she had various positions ranging from product management to research leadership. Her current research interests include automation of knowledge-intensive cyber-physical systems. Elena has co-authored over 20 scientific publications and over 50 patent families.

Abstract: *This talk will cover several aspects of the network operations of the future, done in an automated, proactive, and intent-driven way. I will present different use cases based on digital twins of telecom sites learnt over time and mechanisms for decision-making based on those in a distributed real-time infrastructure.*

RINA 2019 Panel Session

" Industry panel discussion on challenges and opportunities for RINA Adoption"

Abstract: *This panel will discuss challenges and opportunities for RINA adoption with three industry experts. The panel will feature an interactive discussion touching on topics such as what are the top RINA opportunities in different industries; what are the technical and business challenges that are more difficult to deal with; the usual objections to RINA adoption or how these can be overcomed.*

Moderator: Sue Rudd (Strategy Analytics, USA)

Sue Rudd
(Strategy Analytics, USA)

Sue Rudd brings to Strategy Analytics a unique range of marketing strategy and business experience across wireless, fixed telephony and internet services. At Strategy Analytics she focuses on matching new technology to business opportunities for SON, HetNets, Small Cells and Wi-Fi Interoperability as well as service opportunities for Network Slicing, SDN/NFV, Edge Services, Video Delivery Optimization and Telco Cloud. Her reports cover competitive analyses of service platforms, OSS transformation, Cloud database requirements and business cases to maximize CSP Revenue per GB. Prior to joining Strategy Analytics, Sue worked for Comverse Technologies (now Mavenir) developing business cases for converged fixed and mobile IP services and VoIP over 3G. Previously at Motorola Cellular Infrastructure (now Nokia Networks) she coordinated wireless data services and directed projects for mobile network management and Intelligent Networking. Sue has over 30 years' experience selling to Internet, Telecommunications and Mobile service providers for multiple RF and 'dot.com' startups, Codex (Motorola's modem and Enterprise T1 subsidiary), BBN (now Raytheon) and Burroughs Corp. (now Unisys).

Neil Davies
(Predictable Network Solutions, UK)

Neil Davies is an expert in resolving the practical and theoretical challenges of large scale distributed and high-performance computing, particularly scalability effects in large distributed systems, their operational quality, and how to manage their degradation gracefully under saturation and adverse operational conditions. He is a computer scientist, mathematician and hands-on software developer who builds rigorously engineered working systems and scalable demonstrators of new computing and networking concepts. Throughout his 20-year career at the University of Bristol he was involved with early developments in networking, its protocols and their implementations. He collaborated with organisations such as NATS, Nuclear Electric, HSE, ST Microelectronics and CERN on issues relating to scalable performance and operational safety. He was also technical lead on several large EU Framework collaborations relating to high performance switching, and has mentored PhD candidates at CERN. He co-founded Degree2 Innovations in 2000, commercialising network QoS research, and went on to found Predictable Network Solutions in 2003. He has worked on performance aspects of the Department of Defense's Future Combat Systems project, and has developed approaches to delivering consistent video telephony for sign language users over retail broadband. He is the co-author of several patent families.

Sven van der Meer
(Ericsson, Ireland)

Sven van der Meer is a Master Engineer at the Network Management Lab at Ericsson. My team started designing a closed control loop pattern called Sahara, which resulted into a major contribution to Ericsson's COMPA architecture. We then moved to adaptive policies; a topic I've been working on for more than 10 years now. We developed a Unifying Policy Theory (UPT) and did build an Adaptive Policy EXecution Environment (APEX). The APEX software is now subject to an open source contribution. In this context, my team is heavily involved in the Linux Foundation project ONAP, mainly the Policy Framework. I am also involved in advancing RINA, the Recursive InterNetwokring Architecture contributing to the Pouzin Society as well as participating in European projects (FP7 PRISTINE, H2020 ARCFIRE). We gained significant knowledge from the scientific, research, and development activities in the RINA community. Our particular interest is in advancing network management, as in decreasing variance and increasing invariance. This work also informs the product road map of Ericsson network management product my team is contributing to. I was also involved in some standard activities, namely the IETF SUPA policy information model and the MEF modelling work. A large part of my work is dedicated to patents and publications, with regular contributions to IEEE/IFIP NOMS, IFIP/IEEE IM, IEEE CNSM, and some journals in the area of network and service management.

Raghu Ranganathan
(Ciena, USA)

Raghu Ranganathan has been with Ciena since 1998. He has worked extensively on Product Development, Strategy and Standards related to Connectivity Services, Edge Computing, IoT, Network/Service Architecture and Multi-domain Service Orchestration. He has been active in MEF since 2003 and, during 2011-2017, was member of Board of Directors in MEF as well as Co-Chair of Committee developing MEF Specifications. In addition, he has been Editor of multiple MEF Specifications. He is also active in multiple industry activities including ONAP and TIP. Dr. Ranganathan is a Senior Member of IEEE.

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QoE 2019 Program - Monday, February 18

9:00 - 09:10 Welcome speech

9:10 - 09:50 Keynote
Martin Varela (callstats.io, Finland)
Session chair: Lea Skorin-Kapov (University of Zagreb, Croatia)

09:50 - 10:30 Video streaming - I
Session chair: Lea Skorin-Kapov (University of Zagreb, Croatia)

Computing QoE-relevant Adaptive Video Streaming Metrics using Discrete-Time Analysis
Susanna Schwarzmann, Paula Breitbach and Thomas Zinner (TU Berlin, Germany)

QUICker or not? - an Empirical Analysis of QUIC vs TCP for Video Streaming QoE Provisioning
Michael Seufert (AIT Austrian Institute of Technology GmbH, Austria); Raimund Schatz (AIT Austrian Institute of Technology GmbH & Vienna University of Technology, Austria); Nikolas Wehner (AIT Austrian Institute of Technology GmbH, Austria); Pedro Casas (Austrian Institute of Technology (AIT), Austria)

10:30 - 11:00 Coffee Break

11:00 - 12:00 Video streaming - II
Session chair: Alessandro Floris (University of Cagliari, Italy)

Peeking under the Hood: How the Measurement Setup Influences the Video Streaming Behavior
Anika Schwind and Lea Janiak (University of Wuerzburg, Germany); Christian Moldovan (University of Würzburg, Germany); Florian Wamser (University of Wuerzburg, Germany); Tobias Hoßfeld (University of Würzburg, Germany)

Quality Assessment for Adaptive Virtual Reality Video Streaming: A Probabilistic Approach on the User's Gaze
Jeroen van der Hooft and Maria Torres Vega (Ghent University, Belgium); Stefano Petrangeli (Adobe Research, USA); Tim Wauters and Filip De Turck (Ghent University - imec, Belgium)

Implementation of Quantum Decision-Making Based Recommendation Method for Adaptive Bitrate Streaming
Tatsuya Otoshi and Masayuki Murata (Osaka University, Japan)

12:00 - 13:00 Machine learning based quality prediction
Session chair: Tobais Hossfeld (University of Würzburg, Germany)

Stream-based Machine Learning for Real-time QoE Analysis of Encrypted Video Streaming Traffic
Michael Seufert, Pedro Casas, Nikolas Wehner (AIT Austrian Institute of Technology GmbH, Austria); Gang Li and Li Kuang (Huawei, P.R. China)

Towards the Prediction of the Quality of Experience from Facial Expression and Gaze Direction
Simone Porcu, Alessandro Floris and Luigi Atzori (University of Cagliari, Italy)

ACQUA: A user friendly platform for lightweight Network Monitoring and QoE Forecasting
Belmoukadam Othmane (COTE D'AZUR University & inria Sophia ANTIPOLIS, France); Thierry Spetebroot and Chadi Barakat (INRIA Sophia Antipolis, France)

13:00 - 14:00 Lunch

14:00 - 14:40 Keynote
Dario Rossi (Huawei, France)
Session chair: Michael Seufert (AIT, Austria)

14:40 - 15:20 Resource allocation
Session chair: Michael Seufert (AIT, Austria)

The Interplay between QoE, User Behavior and System Blocking in QoE Management
Tobias Hoßfeld (University of Würzburg, Germany); Luigi Atzori (University of Cagliari, Italy); Poul E. Heegaard (Norwegian University of Science and Technology & NTNU, Norway); Lea Skorin-Kapov (University of Zagreb, Faculty of Electrical Engineering and Computing, Croatia); Martín Varela (callstats.io, Finland)

QoE-Aware Resource Allocation for Multiple Cloud Gaming Users Sharing a Bottleneck Link
Ivan Slivar (University of Zagreb, Croatia); Lea Skorin-Kapov and Mirko Suznjevic (University of Zagreb, Faculty of Electrical Engineering and Computing, Croatia)

15:20 - 16:00 Coffee Break

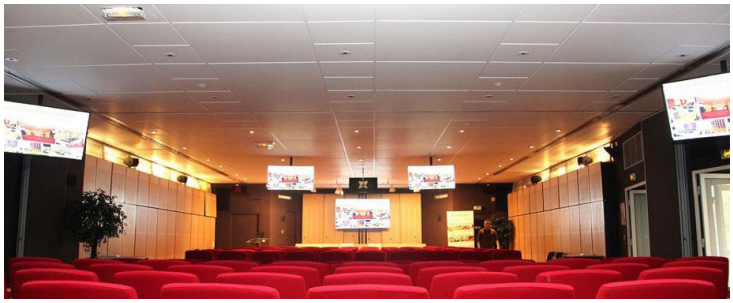
16:00 - 17:00 Quality monitoring
Session chair: Martin Varela (callstats.io, Finland)

Enabling Superior and Controllable Video Streaming QoE with 5G Network Orchestration
Tomas Boros (Slovak University of Technology, Slovakia); Piotr Zuraniewski (TNO & AGH University of Science and Technology, The Netherlands); Rick Hindriks, Niels van Adrichem, Emmanuel Thomas and Lucia D'Acunto (TNO, The Netherlands)

Towards the Definition of the Value of Influence Factors
Data in QoE-aware Management (SHORT PAPER)
Alessandro Floris and Luigi Atzori (University of Cagliari, Italy)

Web View: Measuring & Monitoring Representative Information on Websites
Antoine Saverimoutou (Orange, France); Bertrand Mathieu (Orange Labs, France); Sandrine Vaton (IMT Atlantique, France)

17:00 - 17:05 Closing



RINA 2019 Program - Monday, February 18

09:30 - 09:35 Welcome and Introduction

09:35 - 09:50 The RINArmenia initiative
Phillipe Poux (Startdoon)
Session chair: Peyman Teymoori (University of Oslo, Norway)

09:50 - 10:30 Industry panel discussion on challenges and opportunities for RINA adoption
Sven van der Meer (Ericsson), Raghu Ranganatham (Ciena), Neil Davies (Predictable Network Solutions). Moderated by Sue Rudd (Strategy Analytics)
Session chair: Peyman Teymoori (University of Oslo, Norway)

10:30 - 11:00 Coffee Break (demos will be setup in the room)

11:00 - 13:00 Technical Session
Session chair: Eduard Grasa (Fundació i2CAT)

Experimenting with Real Application-specific QoS Guarantees in a Large-scale RINA Demonstrator
Jordi Perelló (UPC), Albert López (UPC), Davide Careglio (UPC)

First Contact: Can Switching to RINA save the Internet?
Kristjon Ciko (University of Oslo), Michael Welzl (University of Oslo)

Unifying WiFi and VLANs with the RINA model
Leland Smith (Boston University), Dan Cokely (Boston University), Heather Bell (Boston University), Lou Chitkushev (Boston University), John Day (Boston University)

One of the Ways How to Make RIB Distributed
Kamil Jerabek (Brno University of Technology), Vladimir Vesely (Brno University of Technology)

Design Considerations for RINA Congestion Control over WiFi Links
Kristian A. Hiorth (University of Oslo), Michael Welzl (University of Oslo)

Large-scale Experimentation with Network Abstraction for Network Configuration Management
Sven van der Meer (Ericsson), John Keeney (Ericsson), Liam Fallon (Ericsson), Saman Feghhi (Ericsson), Amy Amy de Buitleir (Ericsson)

Error and Flow Control Protocol (EFCP) Design and Implementation: A Data Transfer Protocol for the Recursive Internet Architecture
Miquel Tarzan (Fundació i2CAT), Leonardo Bergesio (Fundació i2CAT), Eduard Grasa (Fundació i2CAT)

Multi-operator "IPC" VPN Slices: Applying RINA to Overlay Networking
Miguel Ponce de Leon (Waterford Institute of Technology), Raghu Ranganathan (Ciena), David Bainbridge (Ciena), Karthik Ramanarayanan (Ciena), Andy Corston-Petrie (BT), Eduard Grasa (Fundació i2CAT)

13:00 - 14:00 Lunch

AIMLEM 2019 Program - Monday, February 18

14:00 - 14:10 Welcome and Introduction

14:10 - 15:30 Technical Session 1
Session chair: Stuart Clayman (UCL, UK)

An Approach to Apply Reinforcement Learning for a VNF Scaling Problem
Hai Nguyen and Tien Van Do (Budapest University of Technology and Economics, Hungary);Attila Hegyi (Nokia - Bell Labs Research, Hungary); Csaba Rotter (Nokia - Bell Labs Research, Hungary)

Improving the QoE of DASH over SDN: A MCDM Method with an Intelligent Approach
Simge Özcan and Muge Sayit (Ege University, Turkey)

Toward Real-time Packet Classification for Preventing Malicious Traffic by Machine Learning
Toki Suga (The University of Tokyo, Japan); Kazuya Okada (The University of Tokyo & ATR, Japan);Hiroshi Esaki (The University of Tokyo, Japan)

15:30 - 16:00 Coffee Break

16:00 - 17:00 Keynote talk + Q & A session
Elena Fersman (Ericsson, Sweden)
Session chair: Stuart Clayman (UCL, UK)

17:00 - 17:50 Technical Session 2
Session chair: Stuart Clayman (UCL, UK)

WCDMA Mean User Throughput Prediction Using Linear Regression Algorithm
Mourad Nasri (Higher School of Communicatins of Tunis, Carthage University, Tunisia);Mohamed Hamdi (University of Carthage, Tunisia)

LTE QoS Parameters Prediction Using Multivariate Linear Regression Algorithm
Mourad Nasri (Higher School of Communicatins of Tunis, Carthage University, Tunisia);Mohamed Hamdi (University of Carthage, Tunisia)

17:50 - 18:00 Wrap up

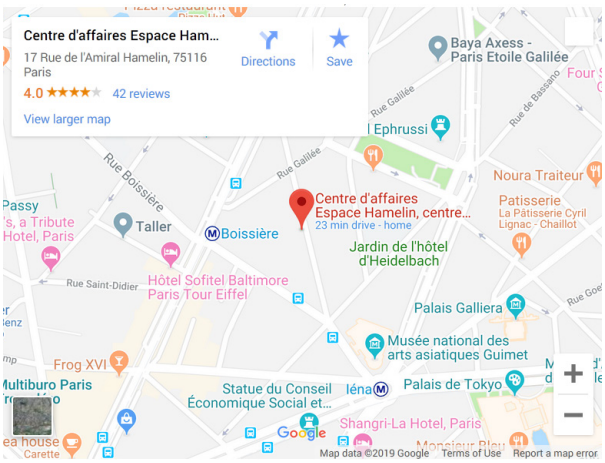
22nd Innovation in Clouds, Internet and Networks

ICIN 2019

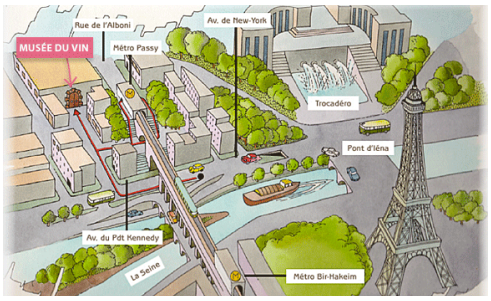
February 18-21, 2019
Paris, France

ICIN 2019 Venue

Espace Hamelin (Centre d'affaires & services)
17 Rue de l'Amiral Hamelin, 75116 Paris



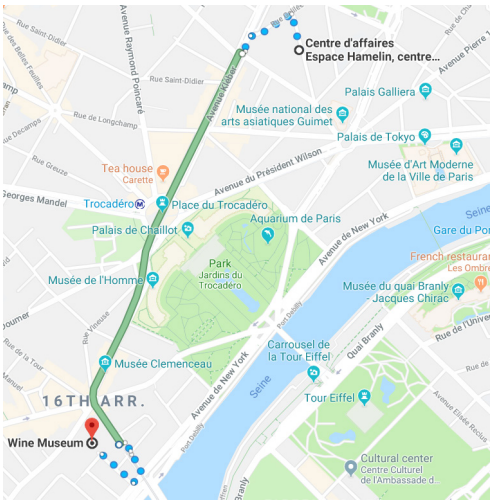
ICIN 2019 Dinner



The conference dinner will take place on Wednesday, February 20, 2019 at:

MUSEE DU VIN PARIS
5 Square Charles Dickens - Rue des Eaux
75016 Paris

Transportation
METRO 6 - Passy Station
BUS 72 - Bir-Hakeim station
RER C - Champs de Mars– Tour Eiffel



From ICIN 2019 venue, take the *Metro 6* from ***Boissière*** (direction Nation), then stop after 3 stations to ***Passy***, after that walk 4mins to the restaurant **MUSEE DU VIN PARIS.**

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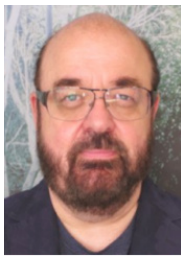

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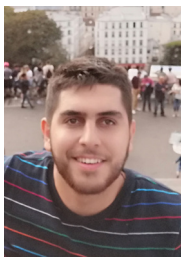

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