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**Paris, France
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Monday, February 24

Monday, February 24 9:30 - 9:35

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Jackson Woodruff

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Monday, February 24 14:00 - 14:05

Welcome, Agenda overview

Room: March

Monday, February 24 14:05 - 14:35

Invited Talk 1

Deploying RINA on a National Scale

Annie Voskanian - RINArmenia

Room: March

Chair: Eduard Grasa (Fundació i2CAT, Internet i Innovació Digital a Catalunya, Spain)

Abstract: In 2019, Armenia developed its local team of experts working - in collaboration with the Pouzin Society - on the development of RINA and defining the various axes comprised within the deployment of this groundbreaking innovation. RINArmenia assumes the mission of expanding the knowledge and expertise in RINA on a national scale; in a country where the IT sector is continually booming, and thus, rapidly shaping the backbone of its economic expansion; in the sole purpose of defining Armenia as the first centre of excellence in RINA.

Monday, February 24 14:35 - 15:05

Invited Talk 2

2STiC: looking at the future of the Internet

Caspar Schutijser, Joeri de Ruiter - SIDN Labs

Room: March

Chair: Eduard Grasa (Fundació i2CAT, Internet i Innovació Digital a Catalunya, Spain)

Abstract: The Internet has become a vital piece of infrastructure in our society. However, the internet was not designed with its current use in mind. As a result the internet suffers from a number of limitations, for example in the area of security and mobility. To address this, AMS-IX, NLnet Labs, SIDN Labs, SURFnet, TU Delft, the University of Amsterdam and the University of Twente work together in the joint research programme called 2STiC (pronounced « to stick »), which is short for Security, Stability and Transparency in inter-network Communication. In this programme, the goal is to develop and evaluate mechanisms for increasing the security, stability and transparency of internet communications, for instance by experimenting with and contributing to next-generation internet architectures. In this presentation, we will introduce the 2STiC programme, give an overview of part of our research so far and our plans with relation to RINA.

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Tuesday, February 25

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High-speed software networks and machine learning: a hands-on overview of AI techniques for network data

Leonardo Linguaglossa (Telecom PairsTech, France), Aldo Lipani (UCL, UK)

Room: La Grande Scène

TU2: Tutorial 2

Distributing intelligence through cloud-to-edge and decentralised technologies

Domenico Siracusa, Daniele Santoro (FBK, Italy)

Room: March

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TU1: Tutorial 1 - Part 2

High-speed software networks and machine learning: a hands-on overview of AI techniques for network data

Leonardo Linguaglossa (Telecom PairsTech, France), Aldo Lipani (UCL, UK)

Room: La Grande Scène

TU3: Tutorial 3

Evolution of Service Deployment in the 5G Radio Network and 5G Core Network

Rogier Noldus (Ericsson, Netherlands)

Room: March

Tuesday, February 25 14:00 - 14:30

Opening Ceremony

Room: La Grande Scène

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Wednesday, February 26

Wednesday, February 26 9:00 - 10:00

K1: Keynote 1

Network Modeling: Finding the Right Level of Abstraction

Jim Kurose (University of Massachusetts, Amherst MA, USA)

Room: La Grande Scène

Chair: Alex Galis (University College London (UCL), United Kingdom (Great Britain))

Abstract: For nearly fifty years, beginning with Kleinrock's pioneering work on using queueing theory to model packet flows in communication networks, network modeling has adopted the individual packet as primary level of granularity for network modeling and analysis. With the advent of terabit-switching capabilities, information-centric networking, and data centers with complex workloads and hundreds of thousands of components, the time would seem ripe to raise the level of abstraction beyond the packet. In this talk, we identify higher-level modeling abstractions are already proving useful as well as new needed abstractions. But also we identify cases where packet-level models are still crucial in providing important insights.

Wednesday, February 26 10:00 - 11:00

K2: Keynote 2

Softwarization and IoT evolution

Lefteris Mamatras (University of Macedonia, Greece)

Room: La Grande Scène

Chair: Alex Galis (University College London (UCL), United Kingdom (Great Britain))

Abstract: The Internet of Things (IoT), a main enabler for Industry 4.0, is considered as a system connecting myriads of people, things and services. IoT enables new large-scale applications with diverse constraints (e.g., limited resource availability or mobility) and requirements (e.g., ultra low delays). A main challenge is the evolution beyond large networks of sensing devices to multiple cooperating network deployments that implement context-sensitive communication and cloud processing strategies, through the seamless adoption of Softwarization technologies. The talk includes the following aspects: (i) a motivation of the above vision with two novel use-cases on smart-city and maritime contexts; (ii) a discussion on the evolutionary and clean-slate approaches to the IoT Softwarization; (iii) the missing elements and open issues in Software-Defined IoT and Edge Cloud technologies; and (iv) insights from our practical experience in relevant implementations and real experiments.

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Wednesday, February 26 14:00 - 15:00

K3: Keynote 3

Network Operations and AI

Rafia Inam (Ericsson, Sweden)

Room: La Grande Scène

Chair: Diego Lopez (Telefonica I+D, Spain)

Abstract: The Fifth Generation Mobile Networks (5G) are seen as a key enabler for diverse-natured industry verticals (such as automotive, manufacturing, mining, utility, health, etc.) by providing a platform to support heterogeneous sets of network quality requirements. The presentation will discuss how Artificial Intelligence and automation can support Telecom industry to manage the increased complexity, scalability, and diversity in its use cases. The work presents different aspects of the network operations of the future, done in an automated, proactive, and intent-driven fashion using different AI techniques.

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Thursday, February 27

Thursday, February 27 9:00 - 10:00

K4: Keynote 4

A Speed of Light Internet Service Provider

Bruce Maggs (Duke University, USA)

Room: La Grande Scène

Chair: Bruno Chatras (Orange Labs, France)

Abstract: A variety of network applications, including electronic commerce and games, are either enabled by or benefit greatly from low latency communications. Studies have shown, however, that over medium and long distances the time to send a packet from one city to another on the public Internet is typically more than three times larger than the lower bound implied by the speed of light in free space. Hence for applications like high-frequency trading, where the winner of a communications race receives all the benefits, special purpose networks have been deployed. For example, between New Jersey and Chicago a succession of networks has been deployed, first fiber-based and then microwave-based, with each network reducing latency by a fraction of a millisecond over the previous. This talk explores the possibility of using the same radio technology to build a network backbone spanning the 120 largest population centers in the United States. The design places radios on existing towers, using topographic maps to ensure line-of-sight connectivity between towers. The impact of weather on the network is evaluated using historical weather data. Our analysis suggests that it should be possible to achieve mean speeds of over 95% of the speed of light over medium and long distances at a transmission cost of under \$1 per GB.

Thursday, February 27 10:00 - 11:00

K5: Keynote 5

Refurbishment of the IP Framework after 50 years of operations

David (Zhe) Lou (Huawei Technologies, Germany)

Room: La Grande Scène

Chair: Bruno Chatras (Orange Labs, France)

Abstract: In the past decades, the Internet has been slowly "fragmented" into Many Networks (ManyNets) due to both technical and commercial reasons. Their incompatible addressing mechanisms hinder the interconnection among those networks. Current Internet Protocol (IP) that aims to connect regional academic and military networks was invented half a century ago. The original IP design philosophy including fixed address length, binding machines to specific locations, and many others might not be suitable for all networks. Furthermore, emerging applications like ARVR, holographic communications, etc. rises new requirements to the network and involves innumerable physical and virtual objects, which requires more efficient and customized network services. In this talk, a novel framework for future Internet protocol will be presented to tackle aforementioned challenges. The new framework will adopt variable-length and multi-semantic network addresses, and enables user-defined networking in order to support futuristic applications.

Thursday, February 27 11:30 - 13:00

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DEP: Distinguished Expert Panel

In-Network Computing and Programmability

Room: La Grande Scène

Chair: Alex Galis (University College London (UCL), United Kingdom (Great Britain))

Moderator:

- Prof. Alex Galis

Panelists:

- Prof. Bruce Maggs (Duke University, USA)
- Prof. Lefteris Mamatras (University of Macedonia, Greece)
- Prof. Jim Kurose (University of Massachusetts, Amherst MA, USA)
- Dr. Marie-José Montpetit (MIT, USA)
- Dr. David (Zhe) Lou (Huawei Technologies, Germany)

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Closing Ceremony

Room: La Grande Scène