

6th IEEE Conference on ***Network Softwarization***

29 June – 2 July 2020 – Virtual Event

Bridging the gap between AI and Network Softwarization

General Co-Chairs

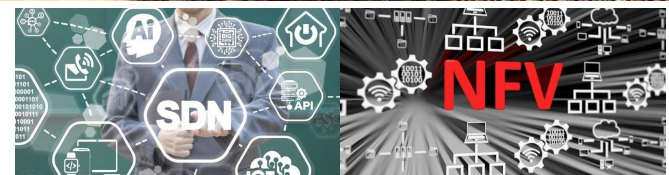
Prosper Chemouil – Filip De Turck

TPC Co-Chairs

Walter Cerroni – Tim Wauters – Mohamed Faten Zhani



Virtual vs original venue



Program

- 4 Keynotes
- 10 Technical Sessions (6 Plenary and 2 Dual-Track)
- 1 Distinguished Expert Panel
- 2 Demo sessions (8 demos)
- 3 Workshops (2 full-day, 1 half-day)
- 4 Tutorials (each half-day)

380+ registered participants !





NetSoft 2020 – TPC Co-Chairs



Key Takeaways from the main Track

- We discussed how to **bridge the gap between AI and Network Softwarization**
- **Machine Learning** is the most promising AI tool for resource allocation, fault detection, security, and many other tasks
- **Programmability** and **Service Abstractions** as key concepts
- **Network Slicing** as key technology
- **Cloud, Fog, Edge computing** as supporting platforms and infrastructures



Highlights of S4SI 2020

- **1 Keynote:** Stefan Schmid, *University of Vienna, Austria*
“Performance and Security Isolation in Softwarized Networks: Advances and Challenges”
- **10 Papers:** 3 Technical Sessions
 - Slicing {IoT, Edge, 5G RAN, Vehicular, Optical}
 - Slicing enablers {ML, SLA, Standards, Models, Perf. Eval., BV-Transp}
- **1 Panel:** *Multifaceted views vs. Fragmentation?*
(6 expert panelists with mixed backgrounds: From 60' to 90' session)
<https://www.slideshare.net/chesteve/netsoft-2020-s4si-workshop-panel>
 - Slicing keeps growing in significance in academia and industry
 - Diverse functional or behavioral perspectives | stakeholder viewpoints
 - “Slicing is here to stay and will keep impacting research & business”
- **Participation:** 35 on average (Min: 25, Max: 50)



Highlights of QoEMAN 2020

■ 2 Keynotes:

- Joergen Gustafsson, Ericsson, “Data and AI-Driven QoE Management”
“Machine Learning is not the present of QoE management but the very near future”
- Lucia D’Acunto, TNO, “The 5G Media Vertical Testbed in the H2020 5GINFIRE project”
“Immersive and Interactive Applications require very timely infrastructure”

■ 6 Papers:

- QoE Modelling
- Immersive and interactive Applications
- Machine Learning and statistical analysis approaches

■ 1 Social Virtual Drink:

“We need to find a way for online conferences to provide the full social event experience, drinks and networking included”

- **Participation:** 35 on average (Min: 25, Max: 50)



Highlights of SecSoft 2020



SECsoft 2020

Virtual Event
July 3, 2020

Workshop co-chairs:
Fulvio Valenza, Politecnico di Torino (IT)
Matteo Repetto, CNR (IT)
Stavros Shiales, University of Portsmouth (UK)

TPCo-chairs:
Eriksson Rios, Tecnalia (SP)
Michal Choraś, FernUniversität in Hagen (DE)
Kaitai Liang, University of Surrey (UK)



Keynote speech



prof. Antonio Skarmeta
University of Murcia, Spain

**“Dynamic Security
Management on IoT through
Network Softwarization”**

9:10 – 10:15

TS1: Attack Detection and Threat Identification

10:30 - 12:15

Session chair: Panagiotis Sarigiannidis, University of Western Macedonia (GR)

- 📄 Programmable Data Gathering for Detecting Stegomalware
👤 **Speaker:** Marco Zuppelli, CNR-IMATI (IT)
- 📄 Impact of Virtual Networks on Anomaly Detection with Machine Learning
👤 **Speaker:** Daniel Spiekermann, Polizeiakademie Niedersachsen (DE)
- 📄 Detection of Insider Threats using Artificial Intelligence and Visualisation
👤 **Speaker:** Stavros Shiales, University of Portsmouth (UK)
- 📄 IoT Malware Network Traffic Classification using Visual Representation and Deep Learning
👤 **Speaker:** Stavros Shiales, University of Portsmouth (UK)

14:45 – 16:00

TS3: Prevention and Defense

Session chair: Wojciech Mazurczyk, Warsaw University of Technology (PL)

- 📄 Introducing programmability and automation in the synthesis of virtual firewall rules
👤 **Speaker:** Daniele Bringhent, Politecnico di Torino (IT)
- 📄 Attestation of Trusted and Reliable Service Function Chains in the ETSI-NFV Framework
👤 **Speaker:** Antonio Suriano, Politecnico di Bari (IT)
- 📄 Collaborative Cyber Attack Defense in SDN Networks using Blockchain Technology
👤 **Speaker:** Mehrdad Hajizadeh, Technical University of Chemnitz (DE)

13:15 – 14:30

TS2: Security Platforms and Architectures

Session chair: Riccardo Sisto, Politecnico di Torino (IT)

- 📄 Secure and Private Smart Grid: The SPEAR Architecture
👤 **Speaker:** Panagiotis Sarigiannidis, University of Western Macedonia (GR)
- 📄 Orchestrating SDN Control Plane towards Enhanced IoT Security
👤 **Speaker:** Adnan Akhuzada, Technical University of Denmark (DK)
- 📄 On the Security of Permissioned Blockchain Solutions for IoT Applications
👤 **Speaker:** Sotirios Brotsis, University of Peloponnese (GR)

16:00 – 17:30

PS: Cyber Security EU-Funded Projects

ASTRID

👤 **Speaker:** Fulvio Rizzo, Politecnico di Torino (IT)



CYBER-TRUST

👤 **Speaker:** Sotirios Brotsis, University of Peloponnese (GR)



SPEAR

👤 **Speaker:** Panagiotis Sarigiannidis, University of Western Macedonia (GR)



SIMARGL

👤 **Speaker:** Wojciech Mazurczyk, Warsaw University of Technology (PL)



GUARD

👤 **Speaker:** Matteo Repetto, CNR – IMATI (IT)



FutureTPM

👤 **Speaker:** Silviu Vlasceanu, Huawei (DE)



▪ **Situational awareness and timely reaction** are the baselines of secure dynamic systems

▪ Towards an **automated security** in complex **orchestrable** systems



Highlights of Monday Tutorials

- **Tutorial #1: Fed4FIRE: A Federation of Testbeds for Hands-On Experimentation**
 - The Fed4FIRE federation of testbeds has been explored
 - Users could experiment with the environment
 - One of the presenters could give real-time answers to the questions
 - **Duration:** 3h
 - **Number of Attendees:** 40 on average
- **Tutorial #2: 5G Security and Privacy: Issues, Potential Solutions and Future Directions**
 - A Comprehensive overview on 5G security and privacy issues has been provided
 - Possible solutions and discussion of future directions have been pointed at
 - **Duration:** 3h
 - **Number of Attendees:** 18 on average



Highlights of Friday Tutorials

Tutorial #3: **Computing in Communication Networks**

Fabrizio Granelli, *University of Trento, Italy*

Frank H. P. Fitzek, *Technical University of Dresden, Germany*

- **Duration:** 3h
- **Number of Attendees:** 25 on average

Tutorial #4: **A Softwarized Perspective of 5G Networks**

Kleber Vieira Cardoso, *Federal University of Goiás, Brazil*

Cristiano Bonato Both, *University of Vale do Rio dos Sinos, Brazil*

Lucio Rene Prade, *University of Vale do Rio dos Sinos, Brazil*

Ciro Macedo, *Federal University of Goiás, Brazil*

Victor Hugo, *Federal University of Goiás, Brazil*

- **Duration:** 3h
- **Number of Attendees:** Up to 40+ participants



Availability of Presentations

- Proceedings are available
- So far all papers have been duly presented → available next in IEEE Xplore
- All presentations have been pre-recorded and available on Whova
- All sessions have been recorded, and will be made available
- We will kindly request each presenter to provide their slides
Instructions to come



About Virtual Event Experience

- **Attract many attendees who would have not joined an in-person event**
- **Too many video presentations wrt live presentations (47/30)**
 - Audience less engaged (Q&As)
 - Not much follow-up as in in-person event
- **Webex experience**
 - Video quality sometimes a bit poor
 - Audio quality usually OK
 - Q&A sessions difficult to handle
 - Video of Presenters/session chairs → does not make it engaging
- **Whova experience**
 - Overall OK not many difficulties to join sessions except for some few people
 - Some improvements to suggest Whova team
 - Very rich interface
 - Allow create networking (by regions or topics)
 - Messaging is nice
 - Sharing papers and or conferences
 - PhD and Job offerings



Student Travel Grants (1)

■ STG Selection Committee

- Prosper Chemouil, *Cnam*, France
- Baek-Young Choi, UMKC, USA
- Kohei Shiimoto, *Tokyo City University*, Japan
- Mohamed Faten Zhani, *ETS Montreal*, Canada

■ STG Selection Process

- Student must be an IEEE Student Member
- Student must be an author and potentially a Presenter*

■ STG paid after the conference

- Student must have attended the event (and presented his/her work)
- STG provided by IEEE ComSoc and NetSoft 2020 budget

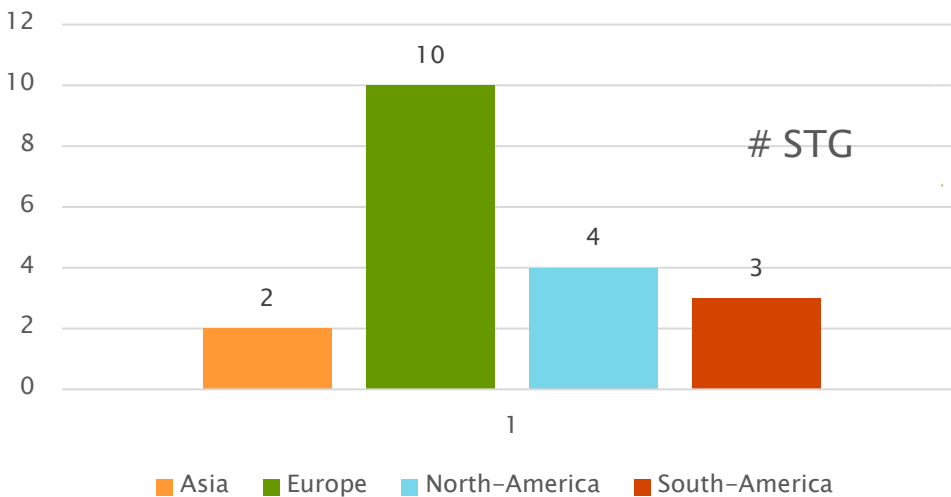
* IEEE Student Members could attend free of charge



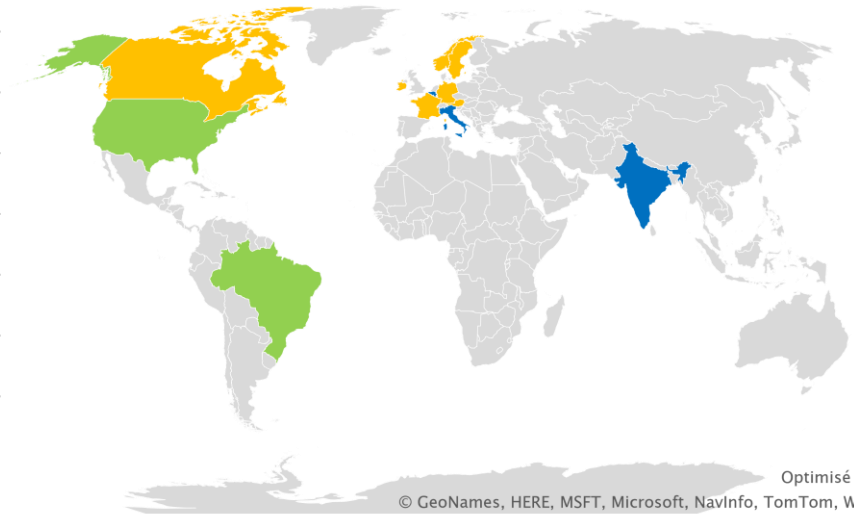
Student Travel Grants (2)

■ Summary

- 19 Eligible Students, all granted a STG
- Students from 12 countries



Distribution of STGs



Student Travel Grants (3)

Alessio Sacco, *Politecnico di Torino, Italy & Saint Louis University, USA*

Alireza Erfanian, *Alpen-Adria-Universität Klagenfurt, Austria*

Danny Alex Lachos Perez, *University of Campinas - UNICAMP, Brazil*

Fabricio Rodriguez Cesen, *University of Campinas - UNICAMP, Brazil*

José Alves Esteves, *Sorbonne University & Orange Labs, France*

Michel Gokan Khan, *Karlstad University & Ericsson, Sweden*

Nathan Saraiva de Sousa, *University of Campinas (Unicamp) & Federal Institute of Piaui, Brazil*

Sergio Gramacho, *Emory University, USA*

Shwetha Vittal, *Indian Institute of Technology Hyderabad, India*

Stefan Schneider, *Paderborn University, Germany*

Sam Van Damme, *UGent-imec, Belgium*

Ali Esmaeily, *Norwegian University of Science and Technology, Norway*

Hamed Jahromi, *University College Dublin, Ireland*

Michael Iannelli, *City University of New York, USA*

Nabhasmita Sen, *Indian Institute of Technology Hyderabad, India*

Daniele Brighenti, *Politecnico di Torino, Italy*

Abdunasser Alowa, *Concordia University, Canada*

Benjamin Ujcich, *University of Illinois at Urbana-Champaign, USA*

José Santos, *UGent-imec, Belgium*



Best Demo Award

- **BDA Selection Committee**
 - Wolfgang John, *Ericsson*, Sweden
 - Sujata, Tibrewala, *Intel*, USA
 - Georgios Xylouris, *NCSR Demokritos*, Greece

- **BDA Selection Process**
 - All demos have been shortlisted
 - Decision based on:
 - Review scores
 - Dedicated hardware
 - Maturity of the demo
 - Relevance to the main topics at Netsoft 2020
 - Presentation (quite even) and Q&A



NetSoft 2020 Best Demo

Enabling Autonomous and Connected Vehicles at the 5G Network Edge

Estefania Coronado, *Fondazione Bruno Kessler, Italy*

with Gabriel Cebrián-Márquez and Roberto Riggio



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Best Demo Paper Award

Estefania Coronado

for the demo paper entitled

“Enabling Autonomous and Connected Vehicles at the 5G Network Edge”

by Estefania Coronado, Gabriel Cebrián-Márquez and Roberto Riggio

 July 2, 2020

Wolfgang John, Sujata Tibrewala, Georgios Xylouris
NetSoft 2020 Demo Chairs



Prosper Chemouil, Filip De Turck
NetSoft 2020 General Chairs

Best Paper Awards

■ BPA Selection Committee

- Walter Cerroni, *University of Bologna, Italy*
- Tim Wauters, *University of Ghent – imec, Belgium*
- Mohamed Faten Zhani, *ETS Montreal, Canada*
- Prosper Chemouil, *Cnam, France*
- Filip De Turck, *University of Ghent – imec, Belgium*

■ Two Awards:

- IEEE NetSoft 2020 Best Paper
- IEEE NetSoft 2020 Best Student Paper



Best Paper Awards

■ BPA Selection Process

- Best papers ranked based on review scores
- Shortlisted to the **top 5** papers
- Additional paper analysis by selection committee
- Research significance and impact
- Presentation and Q&A

■ Best Paper Award

- All 5 top papers were candidates

■ Best Student Paper Award

- First author and presenter must be a student
- Same ranking as BPA, excluding winner and non-student candidates



NetSoft 2020 Best Student Paper

A Performance Modelling Approach for SLA-Aware Resource Recommendation in Cloud Native Network Functions

Michel Gokan Khan, *Karlstad University & Ericsson, Sweden*

with Javid Taheri, Mohammad Ali Khoshkholghi, Andreas J. Kassler, Carolyn Cartwright, Marian Darula and Shuiguang Deng



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Best Student Paper Award

Michel Gokan Khan

for the paper entitled

“A Performance Modelling Approach for SLA-Aware Resource Recommendation in Cloud Native Network Functions”

by Michel Gokan Khan, Javid Taheri, Mohammad Ali Khoshkholghi, Andreas J. Kassler, Carolyn Cartwright, Marian Darula and Shuiguang Deng

 July 2, 2020

Walter Cerroni, Tim Wauters, Mohamed Faten Zhani
NetSoft 2020 TPC Chairs



Prosper Chemouil, Filip De Turck
NetSoft 2020 General Chairs

NetSoft 2020 Best Paper

RLDRM: Closed Loop Dynamic Cache Allocation with Deep Reinforcement Learning for Network Function Virtualization

Bin Li, *Intel Labs, USA*

with Yipeng Wang, Ren Wang, Tsung-Yuan (Charlie) Tai, Ravishankar Iyer, Zhu Zhou, Andrew Herdrich, Tong Zhang, Ameer Haj-Ali, Ion Stoica and Krste Asanović



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Best Paper Award

Bin Li

for the paper entitled

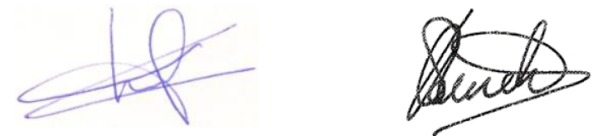
“RLDRM: Closed Loop Dynamic Cache Allocation with Deep Reinforcement Learning for Network Function Virtualization”

by Bin Li, Yipeng Wang, Ren Wang, Tsung-Yuan (Charlie) Tai, Ravishankar Iyer, Zhu Zhou, Andrew Herdrich, Tong Zhang, Ameer Haj-Ali, Ion Stoica and Krste Asanović

July 2, 2020

Three handwritten signatures in blue ink, corresponding to the TPC Chairs.

Walter Cerroni, Tim Wauters, Mohamed Faten Zhani
NetSoft 2020 TPC Chairs

Two handwritten signatures in blue ink, corresponding to the General Chairs.

Prosper Chemouil, Filip De Turck
NetSoft 2020 General Chairs

Thanks to the various contributors

- Authors of 90 (+15 Demo +32 WS) papers submitted
- Reviewers
- Presenters of Papers and Demos (including workshops)
- **Key Speakers:** Keynote, DEP and Tutorial Speakers
- **Technical Program Committee:** 116 key members
 - Selection of the core program
- **Organizing Committee:** 27 members, most of them very active
 - Architecture and orchestration of the event
- **Steering Committee: the Magnificent 7**
 - Guidelines and main initial decisions
- **Special thanks to:**
 - **Christian, Maria** and **Fulvio** for organizing the 3 workshops
 - **Jeroen** and **Andi** for helping almost in real-time for providing us with updated information
 - **Tina** and **Melissa** who monitored Webex sessions backstage, especially when considering time zone

Thank you all





Acknowledgements to Patrons



Platinum



Bronze

Thanks to Partners



Where's next? Poll



|| And the winner is....



IEEE NetSoft 2021

Tokyo, Japan



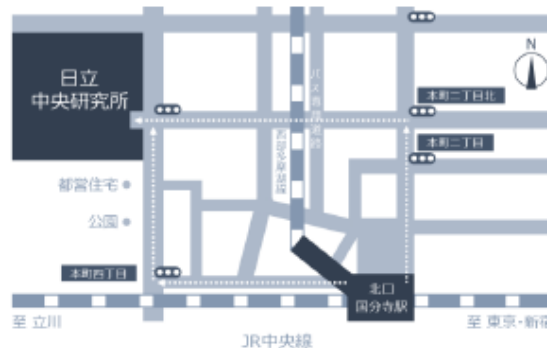
IEEE NetSoft 2021

- **Date: June 28 – July 2, 2021**
- **Venue: Tokyo, Japan**
 - Hitachi BABA Memorial Hall
 - 1 Chome-280 Higashikoigakubo, Kokubunji, Tokyo 185-8601

JR中央線
国分寺駅 北口から 徒歩約10分

日立馬場記念ホールについて

このホールは、日立製作所の創業時メンバーのひとりであり、初代中央研究所所長 馬場象夫氏にちなんで、「日立馬場記念ホール」と命名しました。
ホールは、カンファレンスのほか、イベント会場としてご利用いただけます。



Hitachi BABA Memorial Hall



Conference Centre





Tokyo



Tokyo City



Landmarks





Japanese Cuisine



Cultural Heritage





IEEE NetSoft 2021

June 28 – July 2, 2021

See you in Tokyo!



In the meantime... Conferences

- **12th IEEE International Conference on Networks of the Future (NoF 2020)**
 - October 12-14, 2020 – Bordeaux, France (online)
 - Program released very soon
- **17th International Conference on Network and Service Management (CNSM 2020)**
 - November 2-6, 2020 – Izmir, Turkey (online)
 - Paper Submission Deadline: **July 10, 2020**
- **6th IEEE Conference on Network Functions Virtualization and Software-Defined Networking (NFV-SDN 2020)**
 - November 10-12, 2020 – Madrid, Spain
 - Paper Submission Deadline: **July 13, 2020**
- **24th Conference on Innovations in Clouds, Internet and Networks (ICIN 2021)**
 - March 1-4, 2021 – Paris, France
 - Paper Submission Deadline: **October 8, 2020**
- **18th IEEE/ IFIP Integrated Management Symposium (IM 2021)**
 - May 17-21, 2021 – Bordeaux, France
 - Paper Submission Deadline: **September 15, 2020**



In the meantime... Journals

- **IEEE Transactions on Network and Service Management (TNSM)**
 - EiC: **Filip De Turck**
 - Regular Issues and Special Issues on Advanced Management of Softwarized Networks, Data Analytics and Machine Learning, Security Management, etc
- **Wiley International Journal on Network Management (IJNM)**
 - EiC: **James WK Hong, Jérôme François, Lisandro Granville**
 - Regular Issues and Special Issues
- **Springer Journal on Network and Service Management (JNSM)**
 - EiC: **Luciano P. Gaspary**
 - Regular Issues and Special Issues
- **IEEE Communications Magazine – Series on Telecom Software, Network Virtualization and Softwarized-Defined Networks**
 - Series Editors: **Walter Cerroni, Alex Galis, Kohei Shiimoto, Mohamed Faten Zhani**





Have a safe (virtual) trip back home and enjoy a real beer!

