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Wednesday, November 1

Wednesday, November 1 10:00 - 10:45 (America/New_York)

Cloud Security

10:00 ***Bulwark Security in an Edge Cloud Model***

Jeremy Reed, Ali S Tosun and Turgay Korkmaz

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10:05 ***Punctual Cloud: Achieving Punctuality for Time-Critical Cloud Control Systems***

Haorui Peng, Fatemeh Akbarian, William Tärneberg and Maria Kihl

pp. 9-17

10:11 ***LPMLP-Based Framework for Secure IPsec VPN Cloud Gateway with Advanced Network Monitoring and Issue Resolution***

Vinay K Gugueoth

pp. 18-26

10:16 ***Scale matters: a Comparative Study of Datasets for DDoS Attack Detection in CSP Infrastructure***

Clément Boin, Michael Hauspie, Gilles Grimaud, Tristan Groléat and Xavier Guillaume

pp. 27-35

10:22 ***Real-Time Anomaly Detection Using Distributed Tracing in Microservice Cloud Applications***

Mahsa Raeiszadeh, Amin Ebrahimzadeh, Ahsan Saleem, Roch Glitho, Johan Eker and Raquel A. F. Mini

pp. 36-44

10:28 ***Credibility Management of Cloud-based Digital Forensic Data: A Decentralized Verification Mechanism***

Ruiqing Chu, Xuanyu Liu, Xiao Fu, Bin Luo and Mohsen Guizani

pp. 45-52

10:33 ***Detection of Cyberattacks in Controller Area Network (CAN) Bus System Using a Hybrid Approach***

Asma Alfardus and Danda B. Rawat

Presenter bio: www.rawat.info

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10:39 ***Deblurring as a Defense against Adversarial Attacks***

William Duckworth, Weixian Liao and Wei Yu

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Wednesday, November 1 11:00 - 11:45 (America/New_York)

Cloud Computing

11:00 ***High Frequency Trading on a Low-Latency Fabric in a Cloud Environment***

Larry Ryan, Andrew Addison, Ryan Prins, Daniel Bardsley, Eduard Mikhaylov, Barrett Wakefield, Martin O'Grady and Edward Sepulveda

pp. 68-76

11:05 ***Cloud Telescope: A distributed architecture for capturing Internet Background Radiation***

Fabricio Bortoluzzi, Barry Irwin, Lucas Silvero Beiler and Carla Westphall

Presenter bio: Fabricio Bortoluzzi is an Associate Professor at Noroff University College, Kristansand, Norway. He is also a guest lecturer at University of Itajai Valley, in Itajai, Brasil. He holds a 5-year Bachelor degree in Computer Science (Univali), a Master degree in Computer Science (UFSC), and is currently pursuing a Doctoral degree within the Postgraduate Programme in Computer Science (UFSC).

pp. 77-85

11:11 ***Cloud-Native-Bench: an Extensible Benchmarking Framework to Streamline Cloud Performance Tests***

Michiel Van Kenhove, Merlijn Sebrechts, Filip De Turck and Bruno Volckaert

Presenter bio: Michiel Van Kenhove, M.Sc., is a Ph.D. candidate at IDLab, a research group of the Department of Information Technology, Ghent University - imec, Belgium. He is primarily researching secure cloud technologies in resource restricted environments.

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11:16 ***Understanding the Performance and Power Saving Tradeoffs of Server Sleep States***

Abigail J Griffiths, Adam M Morsman and Paul Veitch

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11:22 ***Constructive Dissonance in the Cloud: Adaptive Out-of-Phase Scheduling for Periodic Tasks***

William Tärneberg and Per Skarin

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11:28 ***A Multi-criteria Context-Sensitive Approach to Offloading Decision Making***

Pedro Paiva Alves, Filipe Fernandes S. B. de Matos, Paulo A. L. Rego and Fernando Trinta

pp. 112-119

11:33 ***P4-MLFQ: A P4 implementation of Multi-level Feedback Queue Scheduling Using A Coarse-Grained Timer for Data Center Networks***

Muhammad Shahid Iqbal and Chien Chen

Presenter bio: He is currently studying PhD student at National Chiao Tunig University. He got His master degree from COMSATS institute of Information Technology, Pakistan. His research interests include Software Defined Networks, P4.

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11:39 ***ZePoP: A Distributed Leader Election Protocol using the Delay-based Closeness Centrality for Peer-to-Peer Applications***

Md Amjad Hossain and Javed Khan

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Wednesday, November 1 1:00 - 1:45 (America/New_York)

Edge Computing

1:00 ***Vehicular Edge Computing-Driven Optimized Multihop Clustering with Data Aggregation***

Ali Jalooli and Frankie Murcia

pp. 135-143

1:11 ***A MAPE-K and Queueing Theory Approach for VNF Auto-scaling in Edge Computing***

Thiago Pereira Silva, Ana Oliveira, André Saraiva, Anselmo Luiz Éden Battisti, Antonio A Rocha, Evandro Luiz Cardoso Macedo, Flávia Coimbra Delicato, Ian Vilar Bastos, Paulo F. Pires and Thais Batista

Presenter bio: Antonio A. de A. Rocha is Associate Professor in the Computer Science Department from the Institute of Computing at the Fluminense Federal since 2011. He received his MSc and PhD degrees in Computer and Systems Engineering (PESC/COPPE) from the Federal University of Rio de Janeiro (UFRJ) Brazil, in 2003 and 2010, respectively. During PhD, in 2008-2009, he was a visiting student in Computer Science at University of Massachusetts-Amherst (UMass). In 2010, he worked as a post-doc researcher at UFRJ, supported by INCT WebScience. Recently, he returned for a sabbatical as a visiting professor at University of Massachusetts-Amherst. He is awarded as Research Productivity Fellowship granted by CNPq and Young Scientist of Rio de Janeiro by FAPERJ. His areas of interest include performance evaluation, traffic engineering, network measurement, next generation Internet, network science and security systems. Dr. Antonio Rocha has published many papers in important journals and conferences, and some of those works received a few awards, such as Best Papers in ACM/CoNEXT, SBC/SBRC and SBC/WPerformance, and nominated among the top-6 PhD theses from Computer Brazilian Society in 2012.

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1:22 ***Accelerating Fingerprint-based Person Identification through Computation Offloading in Edge and Cloud Environments***

Renan A Barbosa, João P. B. Andrade, Mauro Roberto Costa Da Silva, Fernando Trinta and Paulo A. L. Rego

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1:33 ***Security-Aware Resource Allocation in the Edge-Cloud Continuum***

Polyzois Soumplis, Georgios Kontos, Aristotelis Kretsis, Panagiotis Kokkinos, Anastassios Nanos and Emmanouel Varvarigos

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Thursday, November 2

Thursday, November 2 10:00 - 10:45 (America/New_York)

Cloud and Wireless

10:00 ***Optimal Deployment and Orchestration of Multiple Service Function Chains in 5G Networks***

Jing Wang and Amjad Soomro

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10:05 ***Preserving Location Privacy under Maritime 5G using Intent-oriented Scheme***

Yuhang Wang and Salman Nazir

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10:11 ***Evaluating Optimistic Synchronization of Network Graphs in Mobile Networks With MEC Support***
Matthias Frei, Reinhard German and Anatoli Djanatliev
pp. 185-193

10:16 ***NLP-based Cross-Layer 5G Vulnerabilities Detection via Fuzzing Generated Run-Time Profiling***
Zhuzhu Wang and Ying Wang
pp. 194-202

10:22 ***L25GC+: An Improved, 3GPP-compliant 5G Core for Low-latency Control Plane Operations***
Yu-Sheng Liu, Shixiong Qi, Po-Yi Lin, Han-Sing Tsai, K. K. Ramakrishnan and Jyh-Cheng Chen

Presenter bio: Shixiong Qi is a Ph. D. student in the Department of Computer Science and Engineering at the University of California, Riverside. His current research interests focus on serverless computing, Network Function Virtualization, and 5G.

pp. 203-211

10:28 ***SoftFarmNet: Reconfigurable Wi-Fi HaLow Networks for Precision Agriculture***
Nurzaman Ahmed, Flavio Esposito, Okwudilichukwu Okafor and Nadia Shakoor
pp. 212-220

10:33 ***Multi-Drone Mounted Aerial Base Stations' Enhanced Trajectories Planning with Effective Communication Strategies for FANETs***
Sri Suvetha Meenaa Subramanian, Senthil Pon Vignesh Subramanian, Padmapriya Muthiah and Jalaluddin Mohd Ansari Shajahan
pp. 221-228

10:39 ***From Ambiguity to Explicitness: NLP-Assisted 5G Specification Abstraction for Formal Analysis***
Shiyu Yuan, Jingda Yang, Sudhanshu Arya, Carlo Lipizzi and Ying Wang
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Thursday, November 2 11:00 - 11:45 (America/New_York)

AI / Machine Learning

11:00 ***A Sensor Predictive Model for Power Consumption using Machine Learning***
Nalveer Moocheet, Brigitte Jaumard, Pierre Thibault and Lackis Eleftheriadis
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11:03 ***RoMA: Resilient Multi-Agent Reinforcement Learning with Dynamic Participating Agents***
Xuting Tang, Jia Xu and Shusen Wang
pp. 247-255

11:07 ***Unveiling Equity: Exploring Feature Dependency using Complex-Valued Neural Networks and Attention Mechanism for Fair Data Analysis***
Xuting Tang, Mengjiao Zhang, Abdul Rafae Khan, Steve Yang and Jia Xu
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11:11 ***AI-assisted proactive scaling solution for CNFs deployed in Kubernetes***
Menuka Perera, Elisabeth Hanser, Loutfi Nuaymi, Ahmed Bouabdallah, Philippe Bertin and Anwer Al-Dulaimi
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11:15 ***HyFuzz: A NextG Hybrid Testing Platform for Multi-step Deep Fuzzing and Performance Assessment from Virtualization to Over-the-Air***

Jingda Yang and Ying Wang

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11:19 ***Transformer-based Compound Correlation Miner for Smart Home Anomaly Detection***

Andrew F D'Angelo, Chenglong Fu, Xiaojiang Du and Paul Ratazzi

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11:22 ***Federated Machine Learning for Resource Allocation in Multi-domain Fog Ecosystems***

Weilin Zhang, Salman Toor and Mays F AL-Naday

Presenter bio: Mays AL-Naday is an Associate Prof. at the School of Computer Science and Electronic Engineering (CSEE), University of Essex. Her current research focuses on microservice networking, fog computing networks, smart resource management (including energy optimisation), networks for federated learning and security and Quality of Service in B5G/6G. She actively contributed to European projects within the FP7 and H2020 programs, and organised workshops alongside Sigcomm and IFIP NETWORKING.

pp. 290-298

11:26 ***PerCFed: An Effective Personalized Clustered Federated Learning Mechanism to Handle non-IID Challenges for Industry 4.0***

Priyanka Verma, John G. Breslin and Donna O'Shea

pp. 299-306

11:30 ***A multi-task deep learning based vulnerability severity prediction method***

Chun Shan, Zi Y. Zhang and Si Y. Zhou

pp. 307-315

11:34 ***C2MDNIF: A Cross Chain based Method for Domain Name Information Fusion***

Kebin Li, Shen Su and Zhihong Tian

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11:38 ***Efficient Algorithms for Obnoxious Facility Location on a Line Segment or Circle***

QianLong Xiao

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11:41 ***Dual-Teacher for Unsupervised Text Detector in Cloud***

Chuanle Song, Ruijie Shan, Xianfeng Li, Senfeng Lai and Chihui Liu

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Thursday, November 2 1:00 - 1:45 (America/New_York)

Cyber Security

1:00 ***Virtual-Device-Based Policy Enforcement in Multi-Admin Smart Environments***

Yunping Fang, Chenglong Fu and Xiaojiang Du

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1:03 ***A Secure Duplicate Data Sharing Method against Untrusted Cloud Service Provider***

Wang Jiawei, Junjiang He, Xiaolong Lan, Liu Qian, Tao Li and Wenshan Li

pp. 352-359

1:07 ***Intrusion Detection Techniques Analysis in Cloud Computing***
Wuqi Qi, Wei Wu, Hao Wang, Lu Ou, Ning Hu and Zhihong Tian
pp. 360-363

1:11 ***A Serverless Federated Learning Service Ecosystem for Multi-Cloud Collaborative Environments***
Cong Hu, Zhitao Guan, Pengfei Yu, Zhen Yao, Cuicui Zhang, Ruixuan Lu and Peng Wang
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1:15 ***Attribute-based Searchable Proxy Re-encryption Blockchain Data Sharing Scheme***
Guangxia Xu, Yuling Huang and Chuang Ma
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1:19 ***Multivariate Time Series Anomaly Detection with Fourier Time Series Transformer***
Yufeng Ye, Qichao He, Peng Zhang, Jie Xiao and Zhao Li
pp. 381-388

1:22 ***An explainable intrusion detection system based on feature importance***
PeiXin Liao, Xvxin Huang, Qiangbo Huang, Yanming Liang, Zhongxiao Wang and Zhang Denghui
pp. 389-397

1:26 ***Vulnerability Correlation, Multi-step Attack and Exploit Chain in Breach and Attack Simulation***
Junhan Chen, Hui Lu, Zhihong Tian, Rufeng Liang, Chengcong Zheng, Xun Huang, Man Zhang and Xiang Yu
pp. 398-402

1:30 ***Research on the Exploitability of Binary Software Vulnerabilities***
Xiang Tang, Houlin Zhou, Man Zhang, Yuheng Zhang, Guocheng Wu, Hui Lu, Xiang Yu and Zhihong Tian
pp. 403-407

1:34 ***Binary Code Similarity Detection: State and Future***
Zhenshan Li, Hao Liu, Ruijie Shan, Yanbin Sun, Yu Jiang and Ning Hu
pp. 408-412

1:38 ***OPTIMA-DEM: An Optimized Threat Behavior Prediction Method using DEMATEL-ISM***
Jiang Yunxin, Yitong Ren, Ziyu Wang, Yi Tang, Shengtao Lu, Ning Hu, Zhihong Tian and Yinghai Zhou
pp. 413-417

1:41 ***A Survey of Deception Defense: Approaches Used to Counter Malicious Behavior***
Haowen Yi, Fan Li, Rui Wang, Ning Hu and Zhihong Tian
pp. 418-422

Thursday, November 2 2:00 - 2:45 (America/New_York)

Cloud

2:00 ***An Energy-saving Multi-path Traffic Scheduling Approach for Data Center Networks Based on the Rate Scaling***
Guoyi Bu, Kuo Chi, Ting Su and Yongqin Yang
pp. 423-427

2:09 ***A Digital Twins Enabled Reputation System for Microchain-based UAV Networks***

Qian Qu, Simeon Ogunbunmi, Mohsen Hatami, Ronghua Xu, Yu Chen, Genshe Chen and Erik Blasch

pp. 428-432

2:18 ***An Efficient Cache Eviction Strategy based on Learning and Belady Algorithm***

Zhou Wenbin and Qian Wang

pp. 433-437

2:27 ***Robustness Evaluation of Cloud-Deployed Large Language Models against Chinese Adversarial Text Attacks***

Yunting Zhang, Lin Ye, Baisong Li and Hongli Zhang

Presenter bio: Yunting Zhang received the B.S. degrees in information security from Harbin Engineering University, Harbin, China, in 2019. She is currently pursuing the Ph.D. degree in computer science with the Harbin Institute of Technology. Her research interests include adversarial examples, textual adversarial attacks, and artificial intelligence security.

pp. 438-442

2:36 ***Comparative Performance Analysis of Lightweight Bert-derived Models for Cybersecurity Corpus in Cloud Networks***

Yue Wu, Lin Ye, Baisong Li, Hongli Zhang and Jing Cao

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Friday, November 3

Friday, November 3 8:00 - 9:00 (America/New_York)

EdgeCloud - Keynote: Towards Zero-Energy Zero-Trust AI Edge Computing

Dilip Krishnaswamy received a PhD degree in electrical engineering from the University of Illinois at Urbana-Champaign. He has deep experience in the architecture, design & development of engineering platforms & products, and has led engineering teams at Intel, Qualcomm, IBM and Reliance Jio. He has 70+ granted patents and 70+ research publications. He is currently a founder at Quantum Walks Technologies (aka QWalks), an AI/Quantum tech startup.

Chairs: Uttam Ghosh, Sachin Shetty

Towards Zero-Energy Zero-Trust AI Edge Computing

TS1: Supporting services for cloud continuum management

Chair: Namseok Ko

8:00 ***A Brief Review of Population-based Methods for Task Offloading in Cloud-to-Edge Continuum***

Athanasios Chourlias, Theodoros Theodoropoulos, John Violos, Aris Leivadeas, Konstantinos Tserpes and Christos-Kyprianos Zalachoris

pp. 448-453

8:15 ***Autonomous Choreography of WebAssembly Workloads in the Federated Cloud-Edge-IoT***

Continuum

Piotr Sowiński, Ignacio Lacalle, Rafael Vaño and Carlos Palau

pp. 454-459

8:30 ***Pedestrian-centric Augmented Reality Visualization of Real-time Autonomous Vehicle Dynamics***

Yiwei Cheng, Jin Nakazato, Ehsan Javanmardi, Chia-Ming Chang and Manabu Tsukada

pp. 460-465

8:45 ***A Multi-stakeholder Cloud-continuum framework for 6G Networks security & service management***

Rodrigo Asensio-Garriga, Alejandro Molina Zarca and Antonio Fernando Skarmeta Gomez

Presenter bio: Dr. Antonio F. Skarmeta received the M.S. degree in Computer Science from the University of Granada and B.S. (Hons.) and the Ph.D. degrees in Computer Science from the University of Murcia Spain. Since 2009 he is Full Professor at the same department and University. He has worked on different research projects in the national and international area, like IoT6, Openlab, SWIFT, GEN6 . He is associate editor of the IEEE SMC-Part B and reviewer of several international journals.

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Friday, November 3 9:00 - 10:00 (America/New_York)

TS2: Cloud native beyond 5G system

Chair: Jin Nakazato

9:00 ***Co-Scheduling of Radio and Computing Resources for Resource-Efficient Latency Guarantee in 6G***

Sunghyun Jin, Serae Kim and Kyunghan Lee

pp. 472-476

9:15 ***On design and implementation of a cloud-native B5G mobile core network***

Quang Tung Thai, Namseok Ko and Myung-Eun Kim

Presenter bio: Dr. Namseok Ko is currently a Director leading the Mobile Core Network Research Section at Electronics and Telecommunication Research Institute (ETRI). He is also an associate professor at the Department of Information and Communication Engineering, University of Science and Technology (UST). He previously served as a Vice-Chair of ITU-T Focus Group IMT-2020. He is now serving as a Vice-Chair of SG11 and a Rapporteur of Q20 of SG13 in ITU-T. He is also serving as a Vice-Chair of the Technology Committee and the leader of the Network Technology Work Group at 5G Forum, Korea. He received the M.S. and Ph.D. degrees from KAIST, Korea, in 2000 and 2015, respectively. He has participated in various research and development projects including developments of 5G mobile core network technologies since he joined ETRI in 2000. Now he is leading several ongoing projects related to 6G network architecture. His research interests include 5G/6G mobile core network architecture and its enabling technologies, e.g., to support network programmability, the convergence of networking and computing, and non-terrestrial network.

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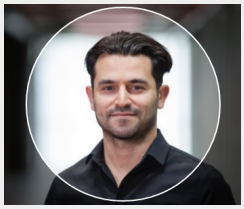
9:30 ***Decentralized Identity Management for Secure Resource Sharing in O-RAN***

Engin Zeydan, Luis Blanco, Josep Mangues-Bafalluy, Suayb S. Arslan and Yekta Turk

Presenter bio: Dr. Arslan received a B.S. degree in EEE in 2006 from Bogazici University, Istanbul, Turkey, the M.S. degree in ECE in 2009 and a Ph.d. degree in 2012 from the University of California, San Diego, USA, all with high honors. In 2009, he joined Mitsubishi Electric Research Laboratory, Boston, MA, where he implemented various ML algorithms. In 2011, he joined Quantum Corporation, Irvine, CA, where he conducted research on advanced detection algorithms. He is currently an visiting associate professor in the department of Brain and Cognitive Sciences at MIT, Cambridge, MA, USA. His research interests include neural signal processing, AI, wireless/wireline communications and magnetic recording/storage technologies, information/reliability theory, cloud/decentralized image/video storage and processing, and cross-layer design optimizations, coding applications, and quantum computing. He serves as session/track chairs in many IEEE conferences and an associate editor for Elsevier IoT Journal.



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9:45 ***Flexible Composition of 6G Networks atop Cloud Continuum***

Slawomir Kuklinski

Presenter bio: Sławomir Kukliński received his PhD with honours from Warsaw University of Technology in 1994, and since then, he is an Assistant Professor there. From 2004 till 2024 he has also been working for Orange Polska as Research Expert focused on mobile and wireless systems with emphasis to self-managed and cognitive solutions. At present, he works on network slicing.He led many national research projects and was involved in many international projects, including FP6 MIDAS, FP7 EFIPSANS, FP7 4WARD, FP7 ProSense, Celtic COMMUNE, 5G!Pagoda, 5G!Drones, MonB5G, Hexa-X, Hexa-X-II. He has coordinated Polish-Luxembourgish project Cognitive SDN (CoSDN). At present, he is involved in the EU project 6G-Cloud. He was working on SDN and network slicing standardization in ITU-T (Study Group 13). Slawomir Kukliński has published more than 90 papers, has served as a member of TPC of many conferences, and gave several invited keynotes.

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Friday, November 3 10:30 - 11:00 (America/New_York)

Keynote1: Secure and distributed computing in the Continuum

Antonio F. Skarmeta, University of Murcia

Chair: Luis Cordeiro

IoT devices and the emergence of 5G in our daily lives are bringing new data-driven and increasingly autonomous scenarios. Next generation networks and the strength of the distributed computing paradigm (edge/cloud) are transforming how services are provisioned, mainly when solutions focus on collaboration and aggregation of resources provided by different entities or organisations, that becomes essential to satisfy the most demanding computation and storage service requirements. However, it also entails challenges such as infrastructure and technologies heterogeneity, which directly impacts infrastructure management and especially security, that usually tends to be relegated to a second place. In this talk we will describe the work carried on several EU project were we use an Intent based/policy-based orchestration paradigm for dealing with heterogeneity, allowing users to request service deployments securely without requiring knowledge about the underlying distributed infrastructure.

Friday, November 3 11:00 - 11:45 (America/New_York)

WS1: Edge Cloud Session

11:00 ***Distributed Self-Orchestration System based on Home 5G Concept***

Cheikh Saliou Mbacke Babou, Masugi Inoue, Yasunori Owada, Kenichi Takizawa and Toshiaki Kuri

pp. 495-500

11:15 ***SPEEDY: Small Prototyping for Number Plate Detection and Speed Estimation using Edge AI***

Shivam Singha, Debajit Saha, Pallab Sarma, Maharaj Brahma, Pranav Kumar Singh and Uttam Ghosh

pp. 501-506

11:30 ***Advanced Federated Learning-Empowered Edge-Cloud Framework for School Safety Prediction***

and Emergency Alert System

Debashis Das, Uttam Ghosh, Pushpita Chatterjee and Sachin Shetty

pp. 507-512

Friday, November 3 11:00 - 11:30 (America/New_York)

Keynote2: Cloud For Holography and Augmented Reality - insights on the CHARITY project

Luis Rosa, OneSource, Portugal

Chair: Namseok Ko

Advanced media applications enabling immersive communication are becoming ubiquitous in our lives. There is a global trend to adopt virtual solutions, e.g. Virtual Reality or Holography, to support day-to-day business operations, social events, and general lifestyle. The requirements for the computing platform and the underlying network are extreme and not easily achievable with today's technologies. The CHARITY project has set off to address this challenge and to develop a complete framework that will meet the requirements of such applications. In this talk we will address the work we have been doing towards an intelligent and automated orchestration of next generation applications in multi-domain cloud infrastructure.

Friday, November 3 11:30 - 1:00 (America/New_York)

Panel: Unleashing the Intelligent Continuum: Cross-Domain Cloud Opportunities

- Kiran Makhijani, Futurewei, USA
- Namseok Ko, Electronics and Telecommunications Research Institute, South Korea
- Jin Nakazato, University of Tokyo, Japan
- Carlos Palau, Politècnica de València, Spain
- Slawomir Kuklinski, Orange, Poland

Chair: Luis Cordeiro

This panel will address various aspects of the next generation of AI-powered edge-to-cloud continuum, including cross-domain continuum management, B5G enablers and applications, the role of AI and emerging security, trust, and privacy challenges.