



**ICSOC 2024**

# **22<sup>nd</sup> International Conference on Service-Oriented Computing**

**December 3 - 6, 2024  
Tunis, Tunisia**



# WELCOME to ICSOC24

The ICSOC (International Conference on Service-Oriented Computing) 2024 conference, held from December 3 to 6, 2024 in Tunis, Tunisia, is the 22nd edition of this prestigious event, considered the leading international forum for presenting the latest and most significant research in the field of service-oriented computing.

ICSOC brings together experts from various disciplines, such as service science, data science, business process management, distributed systems, mobile and wireless computing, cloud and edge computing, cyber-physical systems, Internet of Things (IoT), scientific workflows, artificial intelligence, machine learning, and service and software engineering.

The conference program includes visionary keynote presentations delivered by Prof. Surya Nepal (CSIRO, Australia), Prof. Barbara Pernici (Politecnico di Milano, Italy), and Prof. Samir Tata (LinkedIn, USA). The program includes also research and industry presentations, a panel, workshops, tutorials, and a track dedicated to PhD students.

The areas of interest covered by ICSOC 2024 include different topics that cover five principal categories in the service-oriented computing domain: Service Design and Management, Security and Privacy, Data Analytics and Mining Emerging Technologies, and Social and Business Aspects.

The hosted workshops cover topics varying from established technologies to emerging fields, with a particular emphasis on integrating AI into various aspects of service-oriented computing. This includes four established workshops: 9th ASOCA, 5th AMP, 5th AI-PA, 20th WESOACS, three new workshops focused on AI: GAISS, LAIS, AI on Edge, and four additional specialized workshops: 1st RTSEMS, 2nd SQS, 1st SOCAISA, 1st SOC4AI.



## WELCOME to Tunisia

The Republic of Tunisia is a country in North Africa bordering the Mediterranean Sea. Tourist infrastructure is well developed, and there are several ways to enjoy the loveliness of Tunisia, including spending time on the gorgeous Mediterranean beaches, viewing its ancient ruins, living its thriving desert culture, or sampling its delicious cuisine.

Tunis is the capital of Tunisia and offers a range of must-see attractions. Notably, the ruins of Carthage are easily accessible from the city, and the Punic ports are also interesting. Tunis features a captivating blend of old and new, including colonial French architecture. The souq and the medina are among the most authentic and hassle-free in North Africa.

Tunis is divided into two main areas: the World Heritage-listed old city, known as the medina, and the new city (Ville Nouvelle in French). Avenue Habib Bourguiba is the main thoroughfare in the new city, stretching from the Clock Tower to the Cathedral of St. Vincent de Paul. It then becomes Avenue de France, which continues for a few blocks before ending at Place de la Victoire and the Port de France, a prominent gate that once served as the entrance to the medina.



The Port de France (Bab Bhar) is also a good entry point for exploring the medina. Rue Jemaa Zaytouna leads past many shops to the Zaytouna Mosque, the main mosque of Tunis, located at the heart of the medina. Running diagonally to Rue Jemaa Zaytouna and also accessible near the Port de France is Rue de la Kasbah. This street extends through the medina to Place du Gouvernement and the Place de la Kasbah, a large, open square with heavy security. Navigating between these two streets is relatively straightforward within the labyrinthine medina, making it easy to orient yourself and find an exit. Rue Jemaa Zaytouna is a better entry point from the Port de France at night, as it remains relatively well-traveled, whereas Rue de la Kasbah is more active after dark near Place de la Kasbah. [source: Wikivoyage.org]

## Organizers



Founded in May 1986, the University of Sfax ([www.univ-sfax.tn](http://www.univ-sfax.tn)) comprises prestigious institutions covering nearly all fields of education: Medicine and Paramedical Sciences, Engineering Sciences, Fundamental Sciences, Economic Sciences, Humanities and Legal Sciences, Arts, Music, and Sports.

The university is committed to providing innovative and responsible education and scientific research with a strong socio-economic impact, rooted in social responsibility. It aims to become an entrepreneurial hub driving socio-economic and sustainable development, positioning itself as a center of excellence in training and interdisciplinary research, attractive and synergistic with its socio-economic environment, aiming to shine through national and international exchanges. The core values of the university include excellence, ethics and respect, equity, transparency, as well as responsibility and citizenship.

The University of Sfax includes the Olive Tree Institute for Scientific Research ([www.iosfax.agrinet.tn](http://www.iosfax.agrinet.tn)) and encompasses 19 higher education institutions, which are public higher education establishments, comprising 5 faculties, 4 schools, and 10 institutes across diverse fields.



The ReDCAD laboratory ([www.redcad.tn](http://www.redcad.tn)) is a leader in scientific research on modeling, design, development, and management of autonomous distributed applications including service-oriented ones. It was founded in 2013 at the national engineering school part of the university of Sfax. It gathers more than 110 junior and senior researchers working on topics, like formal approaches for the design of adaptive distributed applications, deployment and management, as well as management of QoS and fault-tolerance of distributed applications.

Recent researches are dealing with modeling design of blockchain-based, and IoT based systems. Application domains include digital health, digital agriculture, and smart-homes. Most of the research activities have been conducted within research projects in collaboration with national and international academic partners.

Since its creation, the laboratory members have published more than 160 indexed journal papers, most of them in Q1 and Q2 journals, and more than 380 papers in ranked conferences. The laboratory senior members supervised and defended more than 90 PhD theses. The activities inside the ReDCAD laboratory are not limited to research, but also include training and coaching of young researchers, collaboration with industrial partners, and organizing national and international scientific workshops and conferences.

## List of workshops

<a href="#">ASOCA</a>	Workshop on Adaptive Service-oriented and Cloud Applications
<a href="#">AIPA</a>	Workshop on AI-enabled Process Automation
<a href="#">WESOACS</a>	Workshop on Engineering Service-Oriented Applications and Cloud Services
<a href="#">GAISS</a>	Workshop on Generative AI as a Software Service
<a href="#">LAIS</a>	Workshop on Lightweight AI-based Services
<a href="#">AI on Edge</a>	Workshop on Optimising AI Models Using Local Data on Resource-Constrained Edge Devices - Training & Inference
<a href="#">RTSEMS</a>	Workshop on RealTime Service oriented and EMbedded Systems
<a href="#">SQS</a>	Workshop on Services and Quantum Software
<a href="#">SOCAISA</a>	Workshop on Service-Oriented Computing, AI, and IoT for Smart Applications
<a href="#">SOC4AI</a>	Workshop on Service-Oriented Computing for AI Applications

## Program of the workshops

<b>December 3, 2024</b>					
Room	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
9:00 - 9:30	ASOCA	SOC4AI	AIPA	LAIS	PhD Symposium
9:30 - 10:00					
10:00 - 10:30					
10:30 - 11:00	<b>Coffee Break</b>				
11:00 - 11:30	SOCAISA	WESOACS	AIPA	SQS	PhD Symposium
11:30 - 12:00					
12:00 - 12:30					
12:30 - 13:00	<b>Lunch</b>				
13:00 - 13:30	SOCAISA GAISS	WESOACS RTSEMS	AI on Edge LAIS	SQS	PhD Symposium
13:30 - 14:00					
14:00 - 14:30					
14:30 - 15:00					
15:00 -	<b>Conference Welcome Reception in the Medina of Tunis: flavor of the Orient</b>				

# Tuesday, 3 December 2024

## Room: Orchidée 4

**Workshop:** ASOCA

**Session Chair:** Nesrine Khabou

[Claudia Raibulet](#)

Expressing Variability in Requirements Specification for Adaptive Dynamic Systems

[Racem Bougacha](#)

9:00-10:30

Towards the interoperability of port Digital Twin systems through ontologies alignment

[Mariam Chaabane and Ismael Bouassida Rodriguez](#)

Architecture Mining approach for Systems-of-Systems: Monitoring and Discovery

[Ezdehar Jawabreh and Adel Taweel](#)

Self-adaptation in Microservice Systems: A Literature Review

10:30-11:00

### Coffee break

**Workshop:** SOCAISA

**Session Chair:** Mohammed Karim Guennoun

[Dhouha Sagga, Amira Ectioui and Fathi Kallel](#)

Deep Learning Techniques for Automatic Seizure Detection in Epilepsy

[Ryhem Essid, Wael Sellami, Hatem Hadj Kacem and Layth Sliman](#)

Towards automatic smart contract generation: Application in Agriculture

11:00-12:30

[Soukaina El Maachi, Rachid Saadane and Wahbi Mohammed](#)

On the Application of Convolutional Neural Networks for the Precision Segmentation of Agronomic Entities: A Comprehensive Study of Crop and Weed Taxonomic Segregation

[Smail Tigani, Hasna Chaibi, Rachid Saadane and Abdelah Chehri](#)

NLP Combined with Bi-LSTM Classifier based Intent Detection Algorithm for Smart House Control using WhatsApp Message

12:30-13:30

### Lunch

**Workshops:** SOCAISA and GAISS

**Session Chairs:** Mohamed Wiem Mkaour

[Imen Abdennadher and Ismael Bouassida Rodriguez](#)

A utility-based approach for adaptation decisions in Smart systems

[Mourad Jbene, Rachid Saadane, Abdeslam Jakim and Abdellah Chehri](#)

Guided Response Generation for Conversational Recommender Systems

13:30-15:00

[Hieu Doan Minh, Bao Tran Quoc, Khanh Vo Hong, Trinh Phung Dang, Khoa Tran Dang, Loc Van Cao Phu, Thong Trinh Duc, Minh Triet Nguyen, Son Ha Xuan and Trung Mai Duc](#)

Aligning Declarations and Practices: Evaluating Privacy Policy Consistency with App Permissions using Generative AI

[Moez Krichen](#)

Generative AI for Software Development: A Survey

# Tuesday, 3 December 2024

## Room: Orchidée 1

**Workshop:** SOC4AI

**Session Chair:** Jose Antonio Parejo Maestre

Francisco Javier Cavero, Juan C. Alonso and Antonio Ruiz-Cortés  
From Static to Intelligent: Evolving SaaS Pricing with LLMs

Pablo Landeta López, Cathy Guevara Vega, José Maria García and Antonio Ruiz Cortés

9:00-10:30 Applying LLMOps to Support the Automatic Analysis of Customer Agreements

Khetam Al Sharou, Mohamed Kadhém Jamei, Ilyes Ben Khalifa, Sondess Missaoui, Montassar Ben Messaoud and Joss Moorkens

UEwMT: Leveraging User Experience and Deep Learning-driven Methodology for Evaluating Machine Translation Services

Matthew Bwye, Carlos Müller and Antonio Ruiz-Cortés  
SaaS Subscription Resource Usage: A Machine Learning Approach

10:30-11:00 **Coffee break**

**Workshop:** WESOACS

**Session Chair:** Khalil Drira

Matthew Bwye, Carlos Müller, José Antonio Parejo and Antonio Ruiz-Cortés  
SaaS Pricing-Aware Demand and Capacity Management

Alejandro García-Fernández, Sergio Laso, José Antonio Parejo, Javier Berrocal, Antonio Ruiz-Cortés and Juan Manuel Murillo  
Towards Effective SaaS Pricing Design: A Case Study of CCSIM

11:00-12:30 Trung Phan, Nghiem Pham, Khoa Tran Dang, Ngan Nguyen Thi Kim, Khiem Huynh Gia, Hieu Doan Minh, Nam Tran Ba, Bao Tran Quoc, Son Ha Xuan and Phat Tran Truong Tuan

Decoding privacy of processing personal data: a privacy policy analytical framework for GDPR Compliance in the business and social apps

Loukas Papadopoulos, Nemanija Borovits, George Manias, Damian Andrew Tamburri and Willem-Jan van den Heuvel

Enhancing Federated Learning with SOA: An Approach to Tackle Non-IID Data Challenges

12:30-13:30 **Lunch**

**Workshops:** WESOACS and RTSEMS

**Session Chair:** Wafa Gabsi

Niklas Sängér and Sebastian Abeck

Externalized and Decentralized Authorization of Microservices

13:30-15:00 Aneta Poniszewska-Maranda, Michał Goleniewski, Witold Maranda and Joanna Ochelska-Mierzejewska

Task Scheduling for container orchestration of Kubernetes in distributed systems development

Alidu Abubakari, Flavio De Paoli and Michele Ciavotta

LLM-Based DAG Creation for Data Enrichment Pipelines in SemT Framework



# Tuesday, 3 December 2024

## Room: Orchidée 2

**Workshop:** AIPA

**Session Chair:** Hamdi Aloulou

[Chiao-Yun Li](#), [Anton Antonov](#) and [Wil van der Aalst](#)

Activity Instance Identification using Bipartite Graph Matching

9:00-10:30

[Wissam Gherissi](#), [Mehdi Acheli](#), [Joyce El Haddad](#) and [Daniela Grigori](#)

Predictive Process Monitoring Using Object-centric Graph Embeddings

[Srinivasan Kidambi](#), [Gautam Vashishtha](#) and [Jagadeesh Chandra Bose R P](#)

InferNet: Next Likely Action Prediction in Business Processes

10:30-11:00

Coffee break

**Workshop:** AIPA

**Session Chair:** Hamdi Aloulou

[Imen Trabelsi](#), [Naouel Moha](#) and [Yann-Gaël Guéhéneuc](#)

Exploring the Systematic Use of LLMs for Microservices Generation

11:00-12:30

[Yongping Tang](#) and [Wei Emma Zhang](#)

CDL+: An Extended Capability Description Language Design For Medical Data-Driven Process

[Alfonso Márquez Chamorro](#), [Adrián Romero-Flores](#), [Manuel Resinas](#) and [Antonio Ruiz Cortés](#)

Causally-informed predictive process monitoring

12:30-13:30

**Lunch**

**Workshops:** AI on Edge and LAIS

**Session Chair:** [Besma Guesmi](#)

[Imen Jegham](#), [Besma Guesmi](#) and [David Moloney](#)

Visual Anomaly Detection In Modern Industrial Manufacturing Systems: Survey, Challenges and Future Directions

13:30-15:00

[Farah Oueslati](#), [Khaoula Elbedoui](#), [Walid Barhoumi](#) and [Mohamed Amine Aissaoui](#)

LLM Non-Text-focused Data Generation for Payroll Fraud Detection

[Imed Ben Dhaou](#), [Alaeddine Mihoub](#) and [Moez Krichen](#)

Lightweight AI-Driven Real-Time Intruder Detection System for IoT-Enabled Smart Meters

[Wajiha Abdul Shakir](#)

Reinforcement Learning Challenges in Power Grid Management: A Case Study with City Learn Simulator

# Tuesday, 3 December 2024

## Room: Mimosa

**Workshop:** LAIS

**Session Chair:** Afef Mdhafar

Emna Guermazi, Afef Mdhaffar, Mohamed Jmaiel and Bernd Freisleben  
Knowledge Distillation for Object Detection Using YOLO-NAS

Hicham Bellafkir, Markus Vogelbacher and Bernd Freisleben  
Urban Sound Classification on Resource-constrained Edge Devices

9:00-10:30

Sameh Samir, Matthieu Saumard, Taheni Damak, Maher Jridi and Mohamed Ali Ben Ayed

Random Forest Based Fast MTS Algorithm for VVC Encoder

Nour Neifar

Knowledge Distillation: A Key Approach for Lightweight Deep Generative Models

10:30-11:00

**Coffee break**

**Workshop:** SQS

**Session Chair:** Jose Garcia-Alonso

11:00-12:30

Antonio Brogi

Distributing Quantum Computations (Invited presentation)

Benjamin Weder

Workflow-based Hybrid Quantum Applications (Invited presentation)

12:30-13:30

**Lunch**

**Workshop:** SQS

**Session Chair:** Benjamin Weder

Álvaro Manuel Aparicio Morales, Jose Garcia-Alonso, Javier Cámara and Juan M. Murillo

Hybrid (Quantum-Classical) Service Applications Deployment Configuration System

13:30-15:00

Antonio García de la Barrera, Manuel Ángel Serrano, Ignacio García Rodríguez de Guzmán, Macario Polo and Mario Piattini

Automatic generation of property-based tests for the verification of quantum algorithms

Sergio Hernández, Danel Arias, Javier Lázaro, Javier Ibarra, Aitor Morais, Iker Pastor-López and Pablo García Bringas

Q-TEE: A Service-Oriented Tool for Assessing the Trainability and Expressivity of Variational Quantum Circuits

# Tuesday, 3 December 2024

## Room: Orchidée 3

### Ph.D. Symposium

**Session Chair:** [Ismail Bouassida](#)

[Jiaxing Qi](#)

Log Analysis with Interpretability and Usability

[Boris Sedlak](#)

Causality-Based Service Adaptations for Elastic Computing Continuum Systems

9:00-10:30

[Aymen Abdelmoumen](#)

A Service-Oriented Framework for Resource-Aware System-of-Systems Modeling in IoT Environments

[Alexandre Sabbadin](#)

Towards a Classification of Edge Service Orchestration Strategies Integrating Renewable Energy

10:30-11:00 **Coffee break**

### Ph.D. Symposium

**Session Chair:** [Ismail Bouassida](#)

[Lobna Ghadhab](#)

Impact of textual (dis)similarities of Bug Report Sections on Duplicate Bug Report Detection Performance

[Filippo Scaramuzza](#)

11:00-12:30 Accountability of Robust and Reliable AI-Enabled Systems: A Preliminary Study and Roadmap

[Souha Ben Hamouda](#)

A framework for the automatic conversion of text into sign language

[Ezdehar Jawabreh](#)

Self-adaptation in Microservice Systems: A Dynamic Software Product Line Approach

12:30-13:30 **Lunch**

### Ph.D. Symposium

**Session Chair:** [Ismail Bouassida](#)

[Marwa Mnasri](#)

Comprehensive Overview: Ethereum Smart Contract Security Testing for Reentrancy Issues

[Sameh Ben Aoun](#)

13:30-15:00 An Overview of a Hybrid Recommendation System for ADAS Using the MAPE-K Approach

[Ryhem Essid](#)

Smart Contract Automation: Solutions for Agriculture

[Rahma Trabelsi](#)

Dynamic Blockchain-Based Access Control for Internet of Things

## Tuesday, 3 December 2024

15:00-21:00 **Conference Welcome Reception:  
Medina of Tunis: Flavor of the Orient**

**15:00h:** Depart from the conference hotel to the city center of Tunis; Avenue Bourguiba or the "Champs Elysees of Tunis". Medina of Tunis.

A guided visit through the winding streets of Tunis' old town, an opportunity to see the rich cultural heritage of old walled city and to discover the exquisite artisanship of Tunisia's artisans. The Medina of Tunis is a living example of one of the most beautiful sites of traditional town planning and architecture in the Arab world. It is also ranked among the UNESCO World heritage: famous for its Ez-Zitouna Mosque (only the inside courtyard) – Les Medersa (Coran school) – National library – Les Fondouks old Palaces etc.



**Option:** Visit of Dar Orient, old house converted into a handicraft center, offering a panoramic view over the old Medina and the surrounding quarters; scenes of the daily life of an upper-class family of yesteryear). Visit of the bustling Souks: You will enjoy walking around these narrow streets, admiring the brightly colored carpets, the pure wool blankets, the small pieces of typical furniture, the traditional Jewellery & perfumes.

**18:00h:** Welcome cocktail in Dar El Jeld Hotel

The Dar El Jeld Hotel offers its guests many opportunities to discover the wealth of archeology and architecture, which lie in Tunis itself and within easy reach of the city. We are located at a walking distance from the ZITOUNA MOSQUE and the COVERED BAZAR surrounding it, locally known as the souks of Tunis. Our staff can open the doors of some of the oldest palaces and grand houses for you. You will discover a wealth of refined decors—painted wood ceilings and tiles—as well as sumptuous hidden courtyards – while enjoying your get together ceremonial cocktail



## Program of the conference

December 4		December 5		December 6	
Registration		Keynote Speaker		Keynote Speaker	
9:00 - 9:30	Opening	Coffee Break		Coffee Break	
9:30 - 10:00	Keynote Speaker	S7: Demo Session		S12: Service Security and Privacy	
10:00 - 10:30	Coffee Break	S8: Industrial session		S13: Edge and IoT	
10:30 - 11:00	S1: Edge and IoT	Lunch		Lunch	
11:00 - 11:30	S2: Generative AI	S9: Generative AI		S14: Cloud Computing	
11:30 - 12:00	S3: Service recommen dataton	S10: Micro-Service		S15: QoS and SLA	
12:00 - 12:30	Lunch	S11: Service Security and Privacy		S16: Processes & workflows	
12:30 - 13:00	Lunch	Social event		Closing session	
13:00 - 13:30	Lunch				
13:30 - 14:00	Lunch	S6: Blockchain		S17: Service composition	
14:00 - 14:30	S4: Edge and IoT	S5: Emerging technologies & approaches		S16: Processes & workflows	
14:30 - 15:00	S5: Emerging technologies & approaches	Coffee Break		S17: Service composition	
15:00 - 15:30	Coffee Break	Panel		Closing session	
15:30 - 16:00	Panel	Tutorial A+B		Closing session	
16:00 - 16:30	Panel	Tutorial C		Closing session	
16:30 - 17:00	Panel	Tutorial C		Closing session	
17:00 - 17:30	Tutorial A+B	Tutorial C		Closing session	
17:30 - 18:00	Tutorial A+B	Tutorial C		Closing session	
18:00 - 18:30	Tutorial A+B	Tutorial C		Closing session	
18:30 - 19:00	Tutorial A+B	Tutorial C		Closing session	

## Wednesday, 4 December 2024

8:30-9:00 Registration

9:00-9:30 Opening

9:30-10:30 **Keynote Speaker:** [Surya Nepal \(CSIRO, Australia\)](#)  
**Session Chair:** [Athman Bouguettaya](#)  
**Room:** Tulipe (Plenary)

**Biography:** Dr Surya Nepal is a senior principal research scientist at CSIRO Data61. He has been with CSIRO since 2000 and currently leads the cybersecurity and quantum systems research group comprising 70 staff and 50 PhD students. His primary area of research focuses on the development and implementation of technologies in distributed systems, with a specific emphasis on security, privacy, and trust. Dr. Nepal has over 250 peer-reviewed publications to his credit. He currently serves as the Interim Editor-in-Chief of IEEE Transactions on Service Computing and is a member of the editorial board of ACM Transactions on Internet Technology. Additionally, Dr. Nepal holds the position of Deputy Research Director at the Cybersecurity Cooperative Research Centre and is also a Conjoint Professor at UNSW.

**Title:** The role of Service Computing in addressing challenges that arise from the adoption and convergence of critical technologies

**Summary:** We are currently in the midst of a rapid and large-scale digital transformation. This transformation is driven by the widespread adoption of digital technologies in critical infrastructure such as energy, transport and health, as well as the emergence of key technologies such as AI/ML, cybersecurity, quantum computing, 6G, AR/VR/XR, and digital twins. As a result, we are seeing the convergence of these critical technologies and the merging of cyber, physical, and human spaces. The successful transition is crucial in creating the safe, responsible, and secure digital world that we envision for the 2050s. The adoption of critical technologies comes with costs and fundamental challenges. This presentation will uncover these challenges and explore how the basic concepts of service computing can be revisited to solve them. It will also highlight the need for rethinking in service computing research and development. The presentation will discuss relevant projects at CSIRO's Data61 to explain the challenges and emphasize the critical role the service computing community could play.

10:30-11:00 **Coffee Break**

## Wednesday, 4 December 2024

**Session 1:** Edge and IoT

**Session Chair:** Claudia Raibulet

**Room:** Orchidée 1&2

Zhiqing Yang, Xiang He, Teng Wang and Zhongjie Wang

An Energy-Efficient Partition and Offloading Method for Multi-DNN Applications in Edge-End Collaboration Environments

11:00-12:30

Yue Ma, Xiaofeng Gao and Guihai Chen

Crowdsourcing Task Assignment with Category and Mobile Combined Preference Learning

Wentao Gao, Omid Tavallaie, Shuaijun Chen and Albert Y. Zomaya

Federated Learning-as-a-Service for Hierarchical Edge Networks with Heterogeneous Models

**Session 2:** Generative AI

**Session Chair:** Yacine Gaci

**Room:** Mimosa

María Jesús Rodríguez Sánchez, Zoraida Callejas Carrión, Ángel Ruíz Zafra and Kawtar Benghazi Akhlaki

Combining Generative AI and PPTalk Service Specification for Dynamic and Adaptive Task-Oriented Chatbots

11:00-12:30

Quentin Nivon and Gwen Salaün

Automated Generation of BPMN Processes from Textual Requirements

Can Wang, Dianbo Sui, Hongliang Sun, Bolin Zhang, Hao Ding and Zhiying Tu

Plug-and-Play Performance Estimation for LLM Services without Relying on Labeled Data

**Session 3:** Service Recommendation

**Session Chair:** Meiju Yu

**Room:** Tulipe (plenary)

Dunlei Rong, Lina Yao, Yinting Zheng, Shuang Yu, Xiaofei Xu, Mingyi Liu and Zhongjie Wang

LLM Enhanced Representation For Cold Start Service Recommendation

11:00-12:30

Saverio Giallorenzo, Fabrizio Montesi, Marco Peressotti, Florian Rademacher, Sabine Sachweh and Philip Wizenty

A Toolchain for Checking Domain- and Model-driven Properties of Jolie Microservices

Sihao Liu, Mingyi Liu, Tianyu Jiang, Shuang Yu, Hanchuan Xu and Zhongjie Wang

GSL-Mash: Enhancing Mashup Creation Service Recommendations through Graph Structure Learning

12:30-14:00

**Lunch**

## Wednesday, 4 December 2024

**Session 4:** Edge and IoT

**Session Chair:** José Antonio Parejo Maestre

**Room:** Orchidée 1&2

Luciano Baresi, Giovanni Quattrocchi and Inacio Gaspar Ticongolo  
Efficient and Dependency-aware Placement of Serverless Functions on Edge Infrastructures

14:00-15:30 Prakhar Jain, Prakhar Singhal, Divyansh Pandey, Giovanni Ennio Quattrocchi and Karthik Vaidhyanathan  
POSEIDON: Efficient Function Placement at the Edge using Deep Reinforcement Learning

Meerzhan Kanatbekova, Shashikant Ilager and Ivona Brandic  
ABBA-VSM: Time Series Classification using Symbolic Representation on the Edge

**Session 5:** Emerging Technologies and Approaches

**Session Chair:** José Maria Garcia Roduiguez

**Room:** Mimosa

Jaime Alvarado-Valiente, Javier Romero-Álvarez, Jorge Casco-Seco, Enrique Moguel, Jose Garcia-Alonso and Juan M. Murillo  
Circuit scheduling policies on current QPUs: QCRAFT Scheduler

14:00-15:30 Yassine Gacha, Olfa Besbes and Takoua Abdellatif  
MuSS: Multimodal Satellite Service for Unsupervised Land-Cover Classification

Xiao Wang, Dunlei Rong, Hanchuan Xu, Xiangdong He and Zhongjie Wang  
HSC: An Artificial Intelligence Service Composition Dataset from Hugging Face

**Session 6:** Blockchain

**Session Chair:** Zhongjie Wang

**Room:** Tulipe (plenary)

Nasrin Sohrabi, Norrathep Rattanaivanon and Zahir Tari  
A query language to enhance security and privacy of Blockchain as a Service (BaaS)

14:00-15:30 Meiju Yu, Rula Sa, Jin Zhang, Yi Zhao, Qi An And Qiaomei Gao  
Blockchain Based Efficient Pairing-Free Certificateless Authentication Scheme for Vehicular Ad-hoc Network

Junaid Akram and Ali Anaissi  
A Blockchain-Enhanced Framework for Privacy and Data Integrity in Crowdsourced Drone Services

Rim Ben Fekih, Mariam Lahami, Mohamed Salem El Eze, Salma Bradai and Mohamed Jmaiel  
Towards an Automated Verification Approach for ERC-based Smart Contracts

15:30-16:00

**Coffee Break**



## Wednesday, 4 December 2024

16:00-17:00 **Panel:** Service computing in the era of generative AI: Research Challenges and opportunities  
**Moderator:** Samir Tata  
**Room:** Tulipe (Plenary)

**Panelists:**

- Athman Bouguettaya
- Massimo Mecella
- Surya Nepal
- Barbara Pernici
- Amel Sellami

This panel will explore the transformative impact of generative AI on the landscape of service-oriented computing. Panelists will delve into how generative AI can revolutionize service design, development, and deployment, leading to more intelligent, adaptive, and personalized services. Key discussions will cover topics such as AI-powered service creation, intelligent service composition, ethical considerations, and the future of human-AI collaboration in service computing:

- **AI-Powered Service Creation and Composition:**  
Panelists will discuss how can AI automate service design, development, and composition, reducing time-to-market and improving service quality?
- **Transforming Service Deployment and Delivery:**  
Panelists will highlight how AI enhances the deployment of services by enabling real-time adaptability, personalization, and predictive maintenance. They will examine the role of AI in optimizing resource allocation, ensuring service reliability, and improving user satisfaction
- **Research Challenges:** Panelists will delve into critical challenges, including:
  - Ensuring the scalability and reliability of AI-integrated services.
  - Addressing security and privacy concerns in service computing with generative AI.
  - Ethical considerations surrounding bias, transparency, and accountability in AI-driven services.

## Wednesday, 4 December 2024

**Tutorial A:** Third-Party Software Library Reuse: From Adoption to Migration

**Tutorial Chair:** [Mohamed Sellami](#)

**Room:** Tulipe (Plenary)

- 17:00-18:00
- [Bader ALKhazi](#)  
Kuwait University, Kuwait
  - [Mohamed Wiem Mkaouer](#)  
University of Michigan-Flint, Michigan, USA
  - [Ali Ouni](#)  
Ecole de technologie superieure, Montreal, Canada

**Tutorial B :** Extract Method Refactoring: Challenges, Opportunities and Applications

**Tutorial Chair:** [Leila Ben Ayed](#)

**Room:** Tulipe (Plenary)

- 18:00-19:00
- [Eman Abdullah AlOmar](#)  
Stevens Institute of Technology, New Jersey, USA
  - [Mohamed Wiem Mkaouer](#)  
University of Michigan-Flint, Michigan, USA
  - [Le Nguyen](#)  
Rochester Institute of Technology, Rochester, NY, USA
  - [Ali Ouni](#)  
Ecole de technologie superieure, Montreal, Canada

**Tutorial C**

**Tutorial Chair:** [Pablo Fernandez](#)

**Room:** Orchidée 1&2

- 17:00-19:00
- [Abdelmajid Khelil](#)  
Landshut University of Applied Sciences, Germany
  - [Aziz Abdennebi](#)  
Landshut University of Applied Sciences, Germany

## Thursday, 5 December 2024

9:00-10:00 **Keynote Speaker:** Barbara Pernici (Polytechnic University of Milan, Italy)  
**Session Chair:** Massimo Mecella  
**Room:** Tulipe (Plenary)

**Biography:** Barbara Pernici is professor in Computer Engineering at the Politecnico di Milano since 1993. Her research interests include adaptive information systems design, data and information quality, IS energy efficiency, data and information quality, and service ecosystems. She has published 80 papers in international journals, had leading roles in IFIP as chair of TC8 Information Systems of the International Federation for Information Processing (IFIP) and of IFIP WG 8.1 on Information Systems Design, and has chaired or cochaired main conferences, as general chair or program chair, including CAiSE, ER, BPM, ICSOC, Coopis, tracks in ICSE and ICIS, and IFIP conferences and workshops. She has been in the editorial board of ACM Trans. on the Web, IEEE Trans. on Service Computing, Business and Information Systems Journal (BISE). She has led the information systems group of Politecnico di Milano in many national and international projects, and is currently leading the project Discount quality for responsible data science: Human-in-the-Loop for quality data

**Title:** Sustainable services

**Summary:** As mentioned in [1], the theme of sustainability is emerging also in Service-Oriented Computing. In the talk, we will focus on some of the aspects of sustainability in service-based data preparation processes and machine learning tasks. We will analyze adaptive approaches and techniques for reducing the amount of needed resources while controlling the impact of information quality. The analysis dimensions and issues in the assessment of quality and sustainability in service-based ecosystems will be discussed.

[1] P Plebani, S Schulte, DA Tamburri, S Dustdar, Service-Oriented Computing: A Trajectory for Research to 2030, IEEE Internet Computing 28 (3), 59-63

10:00-10:30	<b>Coffee Break</b>
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# Thursday, 5 December 2024

**Session 7:** Demonstrations and Resources

**Session Chairs:** Khalil Drira and Saoussen Cheikhrouhou

**Room:** Mimosa

Cédric Sanou, Sami Yangui and Nora Faci

A Running Prototype for Dynamic QoS Management in Cloud Continuum

Manuel Otero, José María García and Pablo Fernandez

OAS-Telemetry - A Telemetry Framework for Microservices in the Cloud Continuum

Amal Abid, Slim Kallel and Mohamed Jmaiel

10:30-12:30 TraSSI: A Confidential Traceability System for Self-Sovereign Identity-based Processes

Haoyang He, Weilong Ding, Hao Zhang and Zhuofeng Zhao

A LLMs-based Procuratorial Service for Detecting Drug Trafficking on Digital Forensics Data

Amine Barrak and Emna Ksontini

Scalable and Cost-Efficient ML Inference: Parallel Batch Processing with Serverless Functions

Mariam Turki, Slim Kallel and Mohamed Jmaiel

EduCheck: Ensuring Diploma Authenticity using Blockchain technology

**Session 8:** Industry papers

**Session Chair:** Takoua Abdellatif

**Room:** Tulipe (Plenary)

Mengjin Liu, Yuxin Zuo, Yang Luo, Daiqiang Wu, Peng Zhen, Jiecheng Guo and Xiaofeng Gao

Weather-Conditioned Multi-Graph Network for Ride-Hailing Demand Forecasting

10:30-12:30 Bora Caglayan, Mingxue Wang, John D. Kelleher, Shen Fei, Gui Tong, Jiandong Ding and Puchao Zhang

BIS: NL2SQL Service Evaluation Benchmark for BI Scenarios

Mahi Begoug and Ali Ouni

How Do Infrastructure-as-Code Practitioners Update their Provider Dependencies? An Empirical Study on the AWS Provider

Imen Jendoubi

Leveraging Machine Learning for Sustainable Urban Energy Solutions: Perspectives and Challenges

12:30-14:00

**Lunch**

# Thursday, 5 December 2024

**Session 9:** Generative AI

**Session Chair:** Boris Sedlak

Room: Mimosa

Yiyuan He, Minxian Xu, Jingfeng Wu, Wanyi Zheng, Kejiang Ye and Chengzhong Xu

UELLM: A Unified and Efficient Approach for Large Language Model Inference Serving

14:00-15:15

Julie Rauer, To Kim Bao Pham, Lawrence Chung, Tom Hill and Sam Supakkul  
Service-Oriented Requirements Elicitation Through Systematic Questionnaire Design: A Problem-Driven GenAI Approach

Ali Ben Mrad, Abdoul Majid O. Thiombiano, Mohamed Wiem Mkaouer and Brahim Hnich

Assessing Large Language Models Effectiveness in Outdated Method Renaming

**Session 10:** Microservice

**Session Chair:** Nawal Guermouche

Room: Orchidée 1&2

Suxiang Wu, Ying Li, Xinzhou Zhu, Meng Xi and Jianwei Yin

CSMO: The Cross-Supervision Method for Microservice Optimization through Decentralized Data Management

14:00-15:15

Brahim Mahmoudi, Imen Trabelsi, Dalila Tamzalit, Naouel Moha and Yann-Gaël Guéhéneuc

BOAM: a Business-Oriented identification Approach of Microservices within legacy systems

Xin Zheng, Guiling Wang, Yuqi Zhang, Boyang Han and Jian Yu

Motif-based Linearizing Graph Transformer for Web API Recommendation

**Session 11:** Service Security and Privacy

**Session Chair:** Sami Yangui

**Room:** Tulipe (Plenary)

Muhammad Umair, Paramvir Singh and Athman Bouguettaya

A Context-Aware Service Framework for Detecting Fake Images

14:00-15:15

Yacine Gaci, Boualem Benatallah, Fabio Casati and Khalid Benabdeslem

Bias Exposed: The BiaXposer Framework for NLP Fairness

Bin Song, Bin Sun, Qiang Fu and Hao Li

FlowShredder: Protocol-Independent In-Network Encryption for Rich Media Traffic

15:15-21:00

**Social event:**

**Visit of Carthage & Sidi Bou Said and Conference Dinner**

## Thursday, 5 December 2024

15:15-21:00 **Social event:**  
**Visit of Carthage & Sidi Bou Said and Conference Dinner**

**15:15:** Departure to Carthage and remainders of the splendours of Tunisia's past. There will be visits to the gigantic Punic Ports, the Antonin Baths, the Tophet as well as the Theatre.

**16:00:** Visit the ruins of these great empires, that lay open to the sun and wildflowers. Declared a national monument the town of Carthage and nearby Salamambo abound in vestiges of the Punic and Roman empires, baths, dwellings, temples, shrines and the fabulous naval port of the Carthaginians.



For a thousand years, Phoenicians were masters of the Mediterranean and over 200 war ships and innumerable merchant vessels were sheltered in the nearby port of Salamambo. At its center, the Admirals Island still exists and archaeologists are

reconstituting the pavilion with its shrine and docks. Next to the ports the ancient sanctuary of the goddess Tanit (Tophet) a quiet, shady square of hundreds of funeral steles.

**17:30:** Continuation to the Moorish village of Sidi Bou Said with its immaculate white and blue houses. The village has managed to preserve its charm and its peacefulness. The most adventurous will have the opportunity to try the famous Shisha (Water pipe). Free time in Sidi Bou Saïd to sip a mint tea at Café Sidi Chabaane or stroll along the narrow streets to see the magnificent view from the cliff



**18:30:** Way to the restaurant “Grand Bleu” Gammarth.

The tour includes

- The Transportation in A/C Busses
- The tour guide
- The entrance to archaeological site in Carthage
- The Gala Dinner

## Friday 6, December 2024

9:00-10:00 **Keynote Speaker:** [Samir Tata \(LinkedIn, USA\)](#)  
**Session Chair:** [Flavio De Paoli](#)  
**Room:** Tulipe (Plenary)

**Biography:** Samir Tata is a Senior Manager at LinkedIn, overseeing teams responsible for the maintenance services of all LinkedIn data centers. Before joining LinkedIn, he managed the Cloud Services team at LG Electronics and served as a Research Staff Member at IBM Research, focusing on IoT and Cloud Computing. Earlier in his career, Samir was a full professor at Telecom SudParis, where he led a research in Service Computing, Cloud Computing, BPM, and IoT. Samir published over 150 papers and 20 US patents.

**Title:** Infrastructure as a Service at Scale: The Journey to Zero-Toil Maintenance at LinkedIn

**Summary:** We will explore LinkedIn's journey towards transforming its compute infrastructure through the Infrastructure as a Service (IaaS) initiative. This effort aims to manage the vast scale of LinkedIn's fleet while minimizing human toil, focusing on efficiency, reliability, and automation. We will dive into the challenges faced when maintaining a fleet of this size and how manual intervention became a bottleneck for scalability and operational excellence. To address this, we embarked on a comprehensive automation strategy that allows our maintenance operations to run autonomously, significantly reducing the need for human oversight. The presentation will showcase:

- Key milestones in rebuilding LinkedIn's compute infrastructure.
- How automation has been integrated into daily fleet operations to achieve zero-toil maintenance.
- Techniques we used to ensure that these operations run without impacting service availability or putting additional pressure on service teams.
- The journey of scaling IaaS with a focus on reliable, self-healing systems.
- Lessons learned and best practices for implementing automated maintenance in large-scale environments.

By the end of the presentation, attendees will gain insights into how LinkedIn is successfully transitioning to a more resilient and efficient infrastructure, allowing us to manage our global fleet with minimal to zero human intervention.

10:00-10:30

**Coffee Break**

## Friday, 6 December 2024

**Session 12:** Service Security and Privacy

**Session Chair:** Antonio Brogi

**Room:** Tulipe (plenary)

Qiang He, Jiyu Yang, Feifei Chen, Cong Tian, Yanhui Li and Yun Yang  
DynaEDI: Decentralized Integrity Verification for Dynamic Edge Data

10:30-12:30

Geming Xia, Chaodong Yu, Linxuan Song, Wei Peng, Yuze Zhang and Hongfeng Li

Heterogeneous Multi Relation Trust for SIIoT Service Recommendation

Selena Lamari, Nadja Benblidia, Chouki Tibermacine, Christelle Urtado and Sylvain Vauttier

Leveraging a Microservice Architecture, Access Control and Interoperability Patterns to Manage Privacy-related User Consents

**Session 13:** Edge and IoT

**Session Chair:** Karim Guennoun

**Room:** Orchidée 2

Hokun Park, Heonchang Yu, Hyungjun Kim, Donggyun Kim, Gyujeong Lim  
Optimizing Traffic Allocation for Multi-Replica Microservice Deployments in Edge Cloud

10:30-12:30

Gara Hellal Yasmine, Lazhar Hamel and Mohamed Graiet

An Event-Based Approach for Horizontally Scalable IoT Applications

Amani Abusafia, Athman Bouguettaya and Abdallah Lakhdari

Efficient Provisioning of IoT Energy Services

Kossi Jean Baptiste Christson Awanyo and Nawal Guermouche

Attention-driven Conflict Management in Smart IoT-based Systems

Daghash K. Alqahtani, Adel N. Toosi and Aamir Cheema

Benchmarking Deep Learning Models for Object Detection on Edge Computing Devices

**Session 14:** Cloud Computing

**Session Chair:** Philip Wizenty

**Room:** Orchidée 1

Ya Shen, Gang Chen, Hui Ma and Mengjie Zhang

Cost-Aware Dynamic Cloud Workflow Scheduling using Self-Attention and Evolutionary Reinforcement Learning

10:30-12:30

Donggyun Kim, Hyungjun KIM, Eunyong Lee and Heonchang Yu

LARE-HPA: Co-optimizing Latency and Resource Efficiency for Horizontal Pod Autoscaling in Kubernetes

Sashko Ristov, Mika Hautz, Philipp Gritsch, Stefan Nastic, Radu Prodan and Michael Felderer

STORELESS: Serverless workflow scheduling with federated storage in sky computing

Weijia Shi, Baokang Zhao and Huan Zhou

Not Best but Fair: Achieving a Fair Service Deployment through Sky Computing for Latency-Sensitive Applications

12:30-14:00

**Lunch**



## Friday, 6 December 2024

**Session 15:** QoS and SLA

**Session Chair:** Luciano Baresi

**Room:** Tulipe (plenary)

Matteo Camilli, Fabio Luccioletti, Raffaella Mirandola and Patrizia Scandurra  
Integrated QoS- and Vulnerability-driven Self-Adaptation for Microservices Applications

14:00-15:45

Boris Sedlak, Andrea Morichetta, Yuhao Wang, Yang Fei, Liang Wang, Schahram Dustdar and Xiaobo Qu

SLO-Aware Task Offloading within Collaborative Vehicle Platoons

Zhengquan Li, Long Cheng and Zheng Song

Client-Specific Homogeneous Service Composition at Runtime for QoS-Critical Tasks

Angelo Marchese and Orazio Tomarchio

Network SLO-Aware Container Orchestration on Kubernetes Clusters

**Session 16:** Processes and Workflows

**Session Chair:** Xiaofeng Gao

**Room:** Orchidée 2

Jiaying Wang, Chengliang Lu, Yifeng Yu, Bin Cao, Kai Fang and Jing Fan

HiGPP: A History-informed Graph-based Process Predictor for Next Activity

14:00-15:45

Tom Lichtenstein, Amit K. Chopra, Munindar P. Singh and Mathias Weske  
From Visual Choreographies to Flexible Information Protocols

Kai Grunert, Janis Joderi Shoferi, Lucas Gold, Wolf Rieder and Axel Küpper  
Architectural Elements of decentralized Process Management Systems

Rui Zhu, Quanzhou Hu, Lijie Wen, Leilei Lin, Honghao Xiao, Chaogang Wang  
LLM-based Business Process Documentation Generation

**Session 17:** Service composition

**Session Chair:** Bora Caglayan

**Room:** Orchidée 1

Saverio Giallorenzo, Jacopo Mauro, Andrea Melis, Fabrizio Montesi, Marco Peressotti and Marco Prandini

Choreography-Defined Network - A Case Study in DoS Mitigation

Alejandro García-Fernández, José Antonio Parejo, Francisco Javier Cavero and Antonio Ruiz-Cortés

14:00-15:45

Racing the Market: An Industry Support Analysis for Pricing-Driven DevOps in SaaS

Robin D. Pesl, Carolin Mombrey, Ilche Georgievski, Kevin Klein, Denesa Zyberaj, Steffen Becker, Georg Herzwurm and Marco Aiello

Compositio Prompto: An Architecture to Employ Large Language Models in Automated Service Computing

Jerin George Mathew, Flavia Monti, Donatella Firmani, Francesco Leotta, Federica Mandreoli and Massimo Mecella

Composing Smart Data Services in Shop Floors through Large Language Models

15:45-16:15

**Closing**

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