



Laboratoire Mixte d'Excellence Scientifique Tuniso-Algérien

MEFOGL: MÉTHODES FORMELLES POUR LE GÉNIE LOGICIEL

3rd Tunisian-Algerian Conference on Applied Computing

06 - 08 November 2023

Diar El Andalous Hotel, Sousse, Tunisia



Committee

Scientific Committee

Program Chairs

Meriem Belguidoum, University of Constantine2, Algeria

Faiza Belala, University of Constantine2, Algeria

Ahmed Hadj Kacem, University of Sfax, Tunisia

Mohamed Jmaiel, University of Sfax, Tunisia

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Aicha Choutri, University of Constantine2, Algeria

Hatem Hadj Kacem, University of Sfax, Tunisia

Slim Kallel, University of Sfax, Tunisia

Monday, November 6

09:00 - 10:00

Registration

10:00 - 10:30

Welcome Coffee

10:30 - 11:00

Opening session

11:00 - 12:00

Invited Speaker

Session Chair: Ahmed Fakhfakh

Chouki Tibermacine, University of Montpellier, France
Leveraging the Use of Microservices to Ensure Diverse
Quality Attributes for Software Systems

12:00 - 13:30

Session 1: Formal Methods

Session Chair: Mohamed Jmaiel

Mohammed Bekkouche.

Locating Loop Errors in Programs: A Scalable and Expressive
Approach using LocFaults.

Fateh Latreche and Hichem Talbi.

Runtime verification of distributed algorithms using high-level
Petri nets

**Aïcha Choutri, Angham Boukhari, Faiza Belala and Ahmed Hadj
Kacem.**

Vers l'amélioration des caractéristiques des réseaux de neurones
profonds : une approche de méta-modélisation.

13:30 - 15:00

Lunch

15:00 - 16:30

Session 2: Artificial Intelligence and Security

Session Chair: Feiza Belala

**Latifa Heroual, Nourelhouda Bouzerzour and Mohamed Lamine
Berkane.**

Towards an AI-Based Approach for Adaptive Emission Control and
Sensor Diagnostics: A gasoline engine case study.

**Amina Eldjou, Mohcene Soltane, Mohamed Elhadi Amoura,
Meriem Belguidoum, Samir Benacer and Ilham Kitouni.**

Enhancing Container Runtime Security: A Case Study in Threat
Detection.

**Nour El Houda Boubaker, Karim Zarour, Nawal Guermouche and
Djamel Benmerzoug.**

Toward Reinforcement Learning-based Framework for Workflow
Migration: Position Paper.

16:30 - 17:00 Coffee Break & Poster Session

16:30 - 18:30 **Session 3: Distributed Systems**

Session Chair: Mariem Belguidoum

Houda Khlif, Hatem Hadj Kacem and Saül E. Pomares.

MCSR: A graph transformation-based approach for Minimal and Compact Set Representation of Causal Dependencies in Distributed Systems.

Alexandre Sabbadin, Abdel Kader Chabi Sika Boni, Hassan Hassan and Khalil Drira

Optimizing network slice placement using Deep Reinforcement Learning (DRL) on a real platform operated by Open Source MANO (OSM).

Amani Mechergui, Wahiba Ben Abdesslem Karaa and Sami Zghal.

Duplication-Driven Distributional Topic Modeling: A Catalyst for Strengthened Classification and Semantic Graphs.

Tuesday, November 7

09:00 - 11:00 **Session 4: Internet of Things & Cyber-physical systems**

Session Chair: Ahmed Hadj Kacem

Nabila Azeri, Ouided Hioual and Ouassila Hioual.

Enhancing Self-Adaptive Cyber-Physical Systems using Federated Machine Learning.

Aymen Abdelmoumen, Zakaria Benzadri and Ismael Bouassida Rodriguez.

Reviewing Recent Literature on IoT-Based System-of-Systems: A Bibliometric Analysis.

Rahma Trabelsi, Ghofrane Fersi and Mohamed Jmaiel.

Misbehaviour detection systems in IoT environment: A survey.

Feryel Benina, Nadira Benlahrache, Faiza Belala and Ahmed Hadj Kacem.

Modélisation et analyse des systèmes cyber-physiques cas du système de surveillance continue du glucose.

11:00 - 18:00 Excursion à Kairouan et Sousse

Wednesday, November 8

- 09:00 - 10:00** **Invited Speaker**
Session Chair: Mohamed Jmaiel
Khail Drira, LAAS, University of Toulouse, France
Toward System model Safety Requirement Proving using Artificial Intelligence
- 10:00 - 11:30** **Session 5: Blockchain**
Session Chair: Zakaria Benzadri
Ahlem Makni, Rawya Mars, Saoussen Cheikhrouhou, Slim Kallel and Mohamed Sellami.
A survey on event log extraction from blockchain.
Ryhem Essid, Wael Sellami and Hatem Hadj Kacem.
MW4BPM: A middleware for Blockchain-Based Business Process Monitoring.
Mariam Lahami and Faten Chabaane
Improving the supply chain management via Blockchain: an olive oil case study.
- 11:30 - 12:00** **Coffee Break & Poster Session**
- 12:00 - 13:00** **Session 6: Artificial intelligence**
Session Chair: Hatem Hadj Kacem
Abir Affes, Afef Mdhaffar, Mohamed Jmaiel and Bernd Freisleben.
A review of usable EEG-based solutions for epileptic seizure prediction.
Souha Ben Hamouda, Wafa Gabsi and Bechir Zaliila.
Towards Bidirectional Conversion between Arabic Sign Language and Speech/Text.
- 13:00 – 13:15** **Closing session**
- 13:15 - 15:00** **Lunch**

Poster Session - Monday, November 6

16:30 - 17:00 **Poster Session**

Rim Ben Fekih, Mariam Lahami, Mohamed Jmaiel and Salma Bradai.

Formal Verification of Smart Contracts based on Model Checking: A Survey

Afef Jmal Maalej and Mohamed Salem Eleze.

Case Study Method: A Step-by-Step Black Box Audit for Security Study of Web Applications

Marwa Mnasri, Afef Jmal Maalej and Mohamed Jmaiel.

Security Testing of Smart Contracts: A Quick Review

Poster Session - Wednesday, November 8

11:30 - 12:00 **Poster Session**

Salma Daoud, Afef Mdhaffar, Mohamed Jmaiel and Bernd Freisleben.

A Survey of Algorithm Selection Techniques for Drug Response Prediction

Riad Helal, Amani Koriche and Faiza Belala.

Vers l'Analyse Formelle des Exigences d'un Système Cyber Physique

Afef Jmal Maalej and Mohamed Salem Eleze.

Security Study of Web Applications through a White Box Audit Approach: A Case Study

Chouki Tibermacine

Associate Professor

Montpellier University, France

<http://www.lirmm.fr/~tibermacin/>



Biography

Chouki Tibermacine is an associate professor at Montpellier University, France. He received a Master of Engineering (engineering degree) in computer systems from Batna University, Algeria, in 2001. Then, he moved to France in 2002 for preparing a Master of Science in distributed systems that he obtained in 2003 at Sorbonne University (previously Paris 6 University). He followed it up with a PhD in software engineering at the University of Southern Brittany, France, earned in 2006.

In 2007, he has been employed at Montpellier University as an assistant then associate professor. In 2018, he obtained his qualification to supervise research and moved from the university's institute of technology to Polytech engineering school. He conducts his research in LIRMM research center where he supervised more than 10 PhD students in collaboration with colleagues from different universities in France, Canada, Algeria and Tunisia

Title

Leveraging the Use of Microservices to Ensure Diverse Quality Attributes for Software Systems

Abstract

The microservice architecture (MSA) style brings many qualities to software system design. The most important ones from a practitioner point of view are: independent deployability, focused scalability, flexibility in delivery and isolated maintainability and testability. Since many years now, this style became a de facto standard in designing architectures in software industry. Software architectures of new large projects are henceforth designed using this style, and architectures of existing still-profitable and-evolvable projects are getting incrementally migrated to this style. In this talk, I'll present some of our contributions to promote this henceforth first-class design and programming entity, namely: i) a method for microservice identification in legacy software systems, driven by data models, ii) a method for assisting the implementation of privacy concerns, like the conformance to GDPR, through the integration of an MSA, and iii) an experience report comparing a monolithic architecture to its MSA variants to evaluate the benefits of this style in terms of efficiency (response time), reliability (request failure rate) and OS resource consumption footprint.

Khalil Drira

Professor

LAAS, University of Toulouse, France

<https://homepages.laas.fr/khalil>



Biography

Khalil Drira obtained the Ph.D. and HDR degrees in Computer Science from Univ. Toulouse, in October 1992, and January 2005 respectively. He joined CNRS as a scientist in 1992, and was tenured in 1993.

He is now a Research Director, a full-time research position at the French National Center for Scientific Research (CNRS). He was head of the networks and communication department at LAAS from 2011-to-2015. He is head of the SARA research team at LAAS. Khalil DRIRA's research interests include formal design and management of distributed communicating systems and networked services.

His research activity addressed and addresses different topics in this field including system architecture design and modeling, adaptability, reconfiguration and autonomic management as well as IoT services, applications and platforms. He initiated an R&D activity about M2M and IoT systems in the context of the European projects ITEA2-USNET (ITEA2 award in 2010) and ITEA2-A2Nets that lead to several outputs including an open-source platform for M2M services and IoT applications: om2m.org and a number of contributions to the international standard oneM2M.

He was involved in different R&D projects including the European projects: IST-DSE, IST-DIAMOND, IP FoF-IMAGINE, the national projects: OSEO-AMIC-TCP, PAI-S2C2 project, and the regional projects DGAC-IMAP and RTRA-ROSACE as well as the collaborative projects: PHC VOLUBILIS TENEMO and PAI UTIQUÉ CMCU. Past projects include the FP6-DSE project and WS-DIAMOND.

Title

Challenges for autonomic Network Service

Abstract

This talk will investigate the challenges for autonomic management of IoT and other network services and applications. The landscape of standardisation initiatives will be explored. The hindering and enabling factors for architecting autonomous network services and related applications will be discussed. The different design solutions will be compared within the current, the emerging and the future technology landscape and its associated scientific and industrial ecosystems.