

Constantine 2 University  
Abdelhamid MEHRI  
LIRE LABORATORY



**RIF'22**

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# PROCEEDINGS

Business Transformation Using  
Emerging Technologies

**THE 11 INTERNATIONAL SEMINARY ON  
COMPUTER SCIENCE RESEARCH AT  
FEMININE**



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# Preface

RIF (Seminary of Computer Science Research at Feminine) is held every year since 2012 by the women's research team of LIRE Laboratory (Laboratoire d'Informatique REpartie) at Constantine 2-Abdelhamid Mehri University in Algeria. It is a scientific event open to researchers to present their research works in different topics and to exchange their theoretical and applied results.

The 11th edition of RIF seminary calls upon female experts from different fields of emerging technologies that can hold business evolution. These technologies such as Augmented Reality, Industry 4.0, Blockchains and Robots, can substantially influence businesses transforming jobs, ways of communicating, as well as modes of production and distribution.

This year, RIF2022 adheres to the idea that technology evolution will eventually renovate business practices. RIF acts as a major forum for the presentation of innovative ideas, approaches, developments, and research projects in the fields of emerging information and communication technologies. The seminary contributions are devoted to the following fields, but is not limited to:

- Modern and Emerging Systems (Internet of Things, Fog Systems, Cloud Systems)
- Cyber-Physical Systems (Industry 4.0, Blockchains, Robots, Augmented Reality)
- Novel Methods and Algorithms in Artificial Intelligence (Machine Learning and Data Sciences)

The eight papers in this special proceeding cover a range of aspects around the seminary theme, from developing new intelligent systems to formal specification and verification. Three of these papers were presented at this year event while five of them were chosen among the seminary past editions of 2020 and 2021. Each of these revised papers has undergone another full double blind peer review, prior to being selected for this special proceeding.

In the first paper *Blockchain-Based Architecture Supporting Hypertension Remote Monitoring in a Cloud Environment*, Insaf boumezbeur, Karim Zarour and Takieddine Bouklouha try to establish and maintain connections among healthcare providers and between healthcare providers and patients with hypertension; that is considered the first chronic disease in Algeria. They presented an architectural approach supporting remote monitoring and hypertension measurement control. This architecture allows the sharing, the fast and supple exchange of information and opens new perspectives of remote monitoring in Algeria. Besides helping save costs, encouraging the control of patients at their homes may also reduce loneliness and the stress they suffer during a hospital stay.

Application auto-scaling is a fault-sensitive operation, a wrong scaling can lead to a loss of money (resources rented without being used), or also to a reduction of the quality of service offered by the application (lack of rented resources). In their work, *A Proactive Formal*

*Approach for Microservice-based Applications Auto-Scaling*, Souheir Merkouche and Chafia Bouanaka use the weak and strong dependencies concept to expect the future state of the system. To formally model the proposed approach, they combine high-level Petri Nets and plausible Petri Nets. The plausible Petri Nets are suitable for decision-making, when several adaptation plans are available, they allow identifying a compromise plan when the auto-scaling concerns different qualities of the system.

Cryptographic circuits have become indispensable in most systems where security is the main criteria. That is why it Abir Bitat and Salah Merniz were interested to verify the correctness of their design. They proposed, in *Formal design and verification of cryptographic circuits: Application to symmetric block ciphers*, a formal methodology that combines two techniques, the SAT Solver technique, which is automatic and has been used to verify the correctness of combinational logic parts; and, the induction technique, which has been used for sequential logic parts. The proposed approach consists of using the functional Hardware Description Language (HDL) Lava to describe both behavioural and structural aspects of a circuit, using Finite State Machines (FSMs). And then to verify the specification and check the equivalence of the implementation against it, to prove the circuit's correctness.

Fatma Kachi and Chafia Bouanaka proposed a formal approach for modelling and analysing quality-driven self-adaptive systems that evolve under uncertainty while still preserving and assuring the continuous satisfaction of an acceptable quality of service. They demonstrated through the *Quality-driven Formal Modelling of the Travel Planner Application* paper the generality and effectiveness of our approach. The findings show how HLPN can be used to model and gather the monitored data to facilitate the autonomous and adaptive service replication decision-making. This example demonstrates how service-based systems can be adapted using a new formalism such as our Petri net-based approach.

Many Machine learning and Deep learning algorithms are being employed in medical imaging to spot diseases. Through the *Effect of Distance Metric and Feature Scaling on KNN algorithm while classifying X-rays* paper, Ishan Arora, Namit Khanduja and Mayank Bansal have constructed a k-NN model that performs classification by considering various distance metrics and feature scaling so to enhance the classification accuracy. Their Experiments were administrated on some public medical datasets collected from the Kaggle Machine Learning repository. Experiment results showed that the k-NN model works well with Canberra distance metric and Robust feature scaling but is more efficient than widely used Euclidean distance and standard feature scaling.

In their research *Service Modeling and Architecting for Self-Adaptive IoT-Based Systems*, Fatima Zohra Merabet and Djamel Benmerzoug advocate the use of the SoS paradigm for building next-generation services using the IoT. They aim to ensure the self-adaptation of these complex systems by providing a particular perspective on the evolution of the field of self-adaptation with a new conception. By extending BPMN, they stress the idea of

adaptation in the design phase, starting from the first step in the BPM (Business Process Management) life cycle. In addition, they propose a global architecture to ensure the self-adaptation of the IoT services at run time. Their architecture aims to let the system collect data about the uncertainties during execution. The system uses this data to resolve uncertainties, be aware of itself, and adjust and satisfy the changing conditions, especially the quality-of-service constraints.

With the advent of the mobile enterprise, the need for a dynamic and flexible security framework to balance risk and trust becomes urgent. This need has led to the rapid expansion and growth of enterprise security technologies for mobility. In *MAM Security Enhancement: Proposed Control Mechanism*, Radhia Khellaf, Souheila Boudouda, Salima Hacini analysed the two most used mobile ecosystem management tools (Mobile Device Management and Mobile Application Management) a security point of view. Moreover, they propose a protection mechanism which strengthens the security aspect of the Mobile Device Management. Their mechanism fixes the Mobile Device Management security vulnerabilities and reduces the impact of attacks. Based on the characteristics of proposed approach activities, a functional diagram is presented.

The e-recruitment phenomenon has been widely spread, which led to the increase of job descriptions online and caused a remarkable growth in the number of jobs seekers sending their resumes searching for new opportunities. This enormous amount of information makes finding the appropriate job/candidate a difficult process. Assia Brek and Zizette Boufaida explored semantic technologies to guide document processing and automatic matching, improving the job recommendation results. Their research, reported in *Semantic Approaches Survey for Job Recommender Systems*, is a literature review of the semantic e-recruitment approaches where they have spotlighted the benefits of exploiting the semantic technologies in different aspects (information extraction and matching) of this context.

These papers were selected based on the originality, quality, and relevance to the topics. Each submission was reviewed, at least, by two reviewers. We hope that reading these papers will inspire you to make your own submissions to future RIF editions.

We are very grateful for the outstanding efforts provided by the Program Committee. The Program Committee members and reviewers provided excellent support in promptly reviewing the manuscripts.

## **Conference Program Chairs**

- Faïza Belala, UC2, Algeria
- Fouzia Magra-Benchikha UC2, Algeria
- Zizette Boufaida, UC2, Algeria

## **Organizing Seminary Chairs**

- Wafa Ghemmaz, UC2, Algeria
- Sahar Smaali, UC2, Algeria
- Rachida Boucebsi, UC2, Algeria
- Ilhem Labed, UC2, Algeria
- Adla Bentellis, UC2, Algeria
- Souad Bouaicha, UC2, Algeria

## **Technical Program Committee**

- Dr. Adla Bentellis, UC2, Algeria
- Dr. Afifa Ghenai, UC2, Algeria
- Dr. Aicha Choutri, UC2, Algeria
- Dr. Asma Djellal, ESCF, Algeria
- Dr. Chafia Bouanaka, UC2, Algeria
- Pr. Faiza Belala, UC2, Algeria
- Pr. Fouzia Benchikha, UC2, Algeria
- Dr. Ilhem Labed, UC2, Algeria
- Dr. Kenza bouaroudj, UC2, Algeria
- Dr. Maya Benabdellahid, ESCF, Algeria
- Dr. Sara Sabba, UC2, Algeria
- Pr. Meriem Belguidoum, UC2, Algeria
- Pr. Nadia Zeghib, UC2, Algeria
- Dr. Nadira Benlahreche, UC2, Algeria
- Dr. Souad Bouaïcha, UC2, Algeria
- Dr. Souheila Boudouda, UC2, Algeria
- Pr. Zizette Boufaida, UC2, Algeria
- Dr. Nacira Chekkai, France
- Dr. Esma Maatougui, Setif 2 University, Algeria
- Dr. Ouassila HIOUAL, Khenchela University, Algeria

## **Keynote Speakers**



### **Miss. Ines Mili**

ALSALAM BANK  
ALGERIA AGENCY DIRECTOR

### **Islamic Digital Finance at Al Salam Bank Algeria**



### **Dr. Maya BENABDELHAFID Ep SOUILAH**

Teacher-Reseacher ESCF of Constantine Algeria

### **The e-administration in the service of Constantine ESCF students**