RABAIE _ BENAMEUR

Researcher | Computer Science

SECURITY OF INFORMATION SYSTEMS AND NETWORKS

GOOGLE SCHOLAR: https://scholar.google.com/citations?user=reAf4ckAAAAJ
RESEARCHGATE: https://www.researchgate.net/profile/Rabaie-Benameur
UDEMY: https://www.udemy.com/user/rabaie-benameur

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EDUCATION

05/2021 – 06/2024

PhD in the field of Security for Information Systems and Networks

University Oran 1 Ahmed Ben Bella (Algeria)

Security of Intelligent and Low-Cost Irrigation Systems for Small-Scale Holders

- A lab prototype of a smart irrigation system was built in collaboration with the electrical department. Subsequently, a more advanced, deployable version was developed from scratch, utilizing an original PCB design and low-cost sensors.
- Incorporate sensors anomalies detection and estimate incorrect values using advanced deep learning techniques.
- Implementation of end-to-end security framework based on adapted Blockchain For edge deployment.
- Implementing a federated learning framework in multi-farm settings facilitates collaborative and continuous training of deep learning models while ensuring the protection of sensitive data.

Domains: IOT AI DL FL BLOCKCHAIN

10/2018 – 10/2020

Master's degree in Information Systems

University Oran 1 Ahmed Ben Bella (Algeria)

- In the first year of the program, we focused on learning the fundamentals of networks and distributed systems. We also explored data science principles and received an introduction to machine learning.
- During the second year, we advanced our understanding of networking concepts and honed our skills in network programming, big data management, wireless sensor networks, and cellular networks. This knowledge was instrumental in developing a low-cost IoT irrigation system using multi-hop wireless communication and deep learning.

Domains: ICTS IOT SECURITY AI ML DL

10/2016 – 07/2020

Licence degree in Information Systems

Universite Hassiba Benbouali Chlef (Algeria)

- Foundational knowledge across various domains of computer science was acquired through a curriculum that included algorithms and data structures, information systems, fundamentals of communication and networking, as well as security.

Domains: ALGORITHMS DATABASE STATISTICS NETWORK SECURITY

LANGUAGES

Arabic

English

French

PROUD OF

First position in the doctoral admission competition

Selected as the first PhD candidate specializing in Information Systems Security and Network Security from among 350 participants in the doctoral admission competition.

Participating in international research projects

I have engaged in international research projects focused on incorporating innovative technologies to solve water scarcity issues using accurate and cost-effective solutions.

Participating in national food security research projects

I have engaged in national research projects aimed at improving water scarcity issues in arid and semi-arid regions worldwide, where water supply is a significant challenge.

PROGRAMMING LANGUAGES

Python	●●●●●
C	●●●●●
JavaScript	●●●●●
Java	●●●●○
PHP	●●●●○
SQL	●●●●○

SCIENTIFIC PRODUCTION

2025

SFEDRL-IDS: Secure Federated Deep Reinforcement Learning-Based Intrusion Detection System for Agricultural Internet of Things

R. Benameur, A. Dahane

- Journal: Cluster Computing
- IF: 3.6
- DOI: 10.1007/s10586-024-05091-1

Keywords: IOT · ANOMALY DETECTION · DEEP REIFORCEMENT LEARNING

2025

A Robust and Scalable Federated Continual Learning for Adaptive DDoS Detection in Heterogeneous IoT Environments

R. Benameur, A. Dahane, S. Souihi, A. Mellouk

- Conference: IEEE International Conference on Communications 2025
- DOI: ACCEPTED

Keywords: IOT · IDS · DEEP LEARNING · FEDERATED CONTINUAL LEARNING · SECURITY · EDGE COMPUTING

2025

FCL-IWQMS: Federated Continual Learning and IoT-Based Water Quality Monitoring System for Adaptive Real-Time Insights

A. Dahane, **R. Benameur** , M. Naloufi , S. Souihi, F. Lucas and A. Mellouk

- Conference: IEEE International Conference on Communications 2025
- DOI: ACCEPTED

Keywords: INTERNET OF THINGS · WATER QUALITY · SWIMMING · HEALTH · DEEP LEARNING · FEDERATED CONTINUAL LEARNING

2024

Udemy Course

Learn Continual Learning Techniques from Scratch Using PyTorch

- URL: ACCESS

Keywords: DEEP LEARNING · CONTINUAL LEARNING

2024

A Novel Federated Learning Based Intrusion Detection System for IoT Networks

R. Benameur, A. Dahane, S. Souihi, A. Mellouk

- Conference: IEEE International Conference on Communications 2024
- DOI: 10.1109/ICC51166.2024.10622538

Keywords: IOT · IDS · DEEP LEARNING · FEDERATED LEARNING · SECURITY · EDGE COMPUTING

2024

IoT Urban River Water Quality System using Federated Learning via Knowledge Distillation

A. Dahane, **R. Benameur** , M. Naloufi , S. Souihi, T. Abreu, F. Lucas and A. Mellouk

- Conference: IEEE International Conference on Communications 2024
- DOI:10.1109/ICC51166.2024.10622491

Keywords: INTERNET OF THINGS · WATER QUALITY · SWIMMING · HEALTH · DEEP LEARNING · FEDERATED LEARNING · KNOWLEDGE DISTILLATION

2024

An Innovative Low-cost IoT-Based Asthma Exacerbation Prediction System Using Federated Learning

A. Dahane,**R. Benameur**, K. Abainia, D. Benatta

- Conference: IAM 2023 6th International Hybrid Conference On Informatics And Applied Mathematics 2023
- DOI: ACCEPTED

Keywords: IOT · ASTHMA EXACERBATION · FEDERATED LEARNING · CENTRALIZED MODEL · LOW-COST.

2024

An Innovative Smart and Sustainable Low-Cost Irrigation System for Anomaly Detection Using Deep Learning

R. Benameur, A. Dahane, B. Kechar, A. Benyamina

- Journal: MDPI Senssors
- IF: 3.9
- DOI: 10.3390/s24041162

Keywords: IOT · SMART FARMING · ANOMALY DETECTION · LOW COST · AUTOENCODER · GAN · BILSTM

2023

Securing IoT Smart Irrigation Systems with Adapted Blockchain Based Approach

Rabaie Benameur, Bouabdellah Kechar, Bidai Zahia, Amine Dahane.

- Conference: 2023 International Conference on Earth Observation and Geo-Spatial Information (ICEOGI)

- DOI: 10.1109/ICEOGI57454.2023.10292955

Keywords: SMART IRRIGATION SYSTEM · IOT · BLOCKCHAIN · POA CONSENSUS · SECURITY · PROTOTYPING

2023

An Innovative Smart and Sustainable Low-cost Irrigation System for Smallholder Farmers' Communities

A. Dahane, **R. Benameur**, B. Kechar

- Conference: 2022 3rd International Conference on Embedded Distributed Systems (EDiS)

- DOI:10.1109/EDiS57230.2022.9996498

Keywords: SMART AGRICULTURE · IRRIGATION · REAL-TIME SYSTEMS · SAFETY · INTERNET OF THINGS · MONITORING

2022

An IoT low-cost smart farming for enhancing irrigation efficiency of smallholders farmers

A. Dahane, **R. Benameur**, B. Kechar

- Journal: Springer Wireless Personal Communications
- IF: 1.9
- DOI: 10.1007/s11277-022-09915-4

Keywords: IOT · SMART FARMING · IRRIGATION · PRECISION AGRICULTURE · LSTM · GRU

2020

An IoT Based Smart Farming System Using Machine Learning

A. Dahane, **R. Benameur**, B. Kechar, A. Benyamina

- Conference: 2020 International Symposium on Networks, Computers and Communications (ISNCC)

- DOI: 10.1109/ISNCC49221.2020.9297341

Keywords: SMART FARMING · IOT · MACHINE LEARNING · SENSING · PRECISION AGRICULTURE

2020

Precision Agriculture: Automated Irrigation Management Platform Using Wireless Sensor Networks

A. Dahane, B. Kechar, A. Benyamina, **R. Benameur**

- Publisher: IGI Global

- DOI: 10.4018/978-1-7998-5000-7.ch006

Keywords: IOT · WSN · SMART FARMING · PRECISION AGRICULTURE · IRRIGATION.

RESEARCH PROJECTS

04/2021–05/2024

INTEL-IRRIS PRIMA Section 2 Project

Intelligent Irrigation System for Low-cost Autonomous Water Control in Small-scale Agriculture

- Project ID: 1560
- Website: https://intel-irris.eu

INTEL-IRRIS is part of the PRIMA Programme supported by the European Union, funded under Section 2 Multitopic 2020 Thematic Area 1-Water management, focusing on low-cost, lean solutions to enhance irrigation efficiency on small-scale farms. The project provides smallholder farmers with an open, low-cost, autonomous irrigation control system leveraging IoT and smart technologies. My contributions to the project include numerous research papers aimed at improving the accuracy of low-cost sensors through anomaly detection and forecasting future measurements using deep learning. Additionally, I have assembled and deployed numerous kits in various regions of Algeria. We have successfully reduced the cost of existing irrigation kits from $2000 to $200, achieving a tenfold cost reduction.

Keywords: IOT IRRIGATION LOW-COST EDGE COMPUTING DEEP LEARNING

10/2021–06/2024

National Research Programs Project

Intelligent and Sustainable Irrigation System for Agricultural Farms - S2IEA

- Project ID: N380/SPH/DPPR/ATRSSV/24

The S2IEA project is part of the national research program on food security. I have contributed to the research and development activities of the project. My responsibilities include designing and implementing a secure and intelligent irrigation system for agricultural farms. The solution uses federated learning to preserve data privacy while training accurate global models and secures data using blockchain technology. Additionally, I have participated in various research activities, produced scientific work for indexed journals and international conferences, and authored deliverables.

Keywords: IOT IRRIGATION LOW-COST FEDERATED LEARNING BLOCKCHAIN

09/2021–06/2024

PRFU Project

Internet of Things and Artificial Intelligence Serving Food Security in Algeria

- Project ID:C00L07UN310120220008

The project aims to utilize the Internet of Things and artificial intelligence to enhance food security in Algeria, focusing on developing integrated kits for smart irrigation and aquaculture monitoring. My role in smart farming emphasizes disseminating research findings through peer-reviewed journal publications and presentations at international conferences. Additionally, I contribute as an organizer in numerous events supported by the university, and I have supervised three master's students in the same thematic area.

Keywords: IOT AQUACULTURE SMART FARMING LOW-COST DEPLOYMENT

TEACHING EXPERIENCE

Data Structures and Algorithms
2022 – 2023
Department of Computer Science, Oran 1 Ahmed Ben Bella University

Network and communication
2022 – 2023
Department of Computer Science, Oran 1 Ahmed Ben Bella University

Measuring physical quantities
2022 – 2023
Department of Computer Science, Oran 1 Ahmed Ben Bella University

Advisor for graduate students pursuing a Master's degree in Computer Science
2021 – 2022
Security of IoT Systems Using Blockchain Technology
2023 – 2024
Water Quality Monitoring System in Aquaculture
2023 – 2024
Crop Recommendation System using Machine Learning

SCIENTIFIC ACTIVITIES

- As part of the PRIMA INTELL-IRRIS project at the University of Pau, France, I contributed to the development of the gateway's intelligent module. My work focused on creating a continual learning framework to predict soil moisture and identify anomalous patterns, improving the system's adaptability and precision.

- I presented our recently innovative research product at the Research, Development, and Innovation event organized by the Algerian research agency, DGRSDT, in Algiers.

- Participated as an organizer of the event : SMART FARMING I.

- Participated as an organizer of the event : SMART FARMING II.

- Participated as an organizer of the event : 3rd Scientific and Technical Day SMART FARMING III "New Technologies for Food Security and Sustainable Development", February 28, 2024, University of ORAN1 Ahmed Ben-Bella.

- Participated in the workshop organized during the event: Study days onnew AI technologies and its societal and industrial applications, January 30 and 31, 2024, ORAN1 Ahmed Ben-Bella University.

- Attended the SaCoNeT workshop held in Oran, Mai 7-10, 2021, Algeria.

- Attended the SaCoNeT workshop held in Oran, Mai 7-10, 2022, Algeria

- Attended the SaCoNeT workshop held in Oran, Mai 7-10, 2023, Algeria.