



# Prof. Abdellatif KOBANE

## Full Professor

ENSIAS, Mohammed V University in Rabat, Morocco

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Married, 2 childrens

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## Current SITUATION

- Full Professor at ENSIAS, Mohammed V University in Rabat, Morocco
- Member of Rabat IT Center
- Head of Web & Mobile Engineering departement
- Expert CNRST
- Expert UM6P
- Expert Qatar Fondation
- IEEE Senior Member

## Diplomas —

### Doctorate (2008)

### DESA (2003) (Master's Degree)

## Professionals —

### PES (19/12/2019-)

### PESH (13/11/2013-18/12/2019)

### PESA (13/11/2009-12/11/2013)

### CNC (2012 2020) ATER (09/2008 - 08/2009)

### MPM(2016-2020)

## Academic Background

### **Ph.D. in computer Science trough joint supervision**

**Joint Ph.D. program:** Mohammed V University-Agdal, Morocco  
and University of Avignon, France

**Laboratory :** LIMIARF at Faculty of Sciences-Rabat, Morocco  
and

LIA, University of Avignon, France

**Title:** Performance Evaluation in WCDMA Cellular Networks  
with Multimedia Applications

**Distinction :** With Highest Hononrs

### **Advanced Graduate Studies Diploma (Master)**

**Specialization :** Computer Science, Telecommunications &  
Multimedia

**Institutions :** Mohammed V University Agdal, Faculty of  
Sciences-Rabat, In collaboration with the National Institute of  
Posts and Telecommunications (INPT)

## Experiences

### **Full Professor**

National Higher School of Computer Science and Systems  
Analysis (ENSIAS), Mohammed V University in Rabat, Morocco

### **Associate Professor**

National Higher School of Computer Science and Systems  
Analysis (ENSIAS), Mohammed V University in Rabat, Morocco

### **Assistant Professor**

National Higher School of Computer Science and Systems  
Analysis (ENSIAS), Mohammed V University in Rabat, Morocco

**President of the Common Entrance Examination for  
Engineering Schools in Morocco CNC 2020 at Dakhla Center  
(5 days)**

**ATER : Teaching and Research Contract**

EMC (2020-2022)

CNC (2012)

University of Avignon, France

**Master Program Manager**

Internet of Things and Mobile Services (IOSM) (2016-2020)

**Elected Member of the University Council**

**President of the Common Entrance Examination for Engineering Schools in Morocco CNC 2012 Guelmim Center (5 days)**

## Expertise —

### Experiences

- Expert Evaluator : CNRST Since 2020
- Expert Evaluator : Qatar Fondation, Since 2020
- Expert Evaluator : UM6P Since 2020
- Expertise in the Evaluation of Bachelor's and Engineering Programs: 2012 to 2014
- Member of the Jury of the International Selection Committee for the IT Competition du IEEE ComSoc (IEEE Student Competition) 2018-2021
- Expert Evaluator for Scientific Articles in International Conferences and Journals
- Member of the International Conference Evaluation Committee (Core Rankings)

## Teaching —

### Teaching Activities

*My courses cover various modules in the fields of computer science and networks for the engineering program, Master's program, as well as the Bachelor's program.*

**Networks:** Communication Networks, Local Area Networks, TCP/IP, Switching and Interconnection, WAN Technologies, IPv6 Protocol, Mobile wireless network.

**Emerging Technologies:** Internet of Things, Emerging Cloud Technologies, CDN, SDN, Fog Computing, Blockchain, Cybersecurity, VoIP, Virtualization, ...

## Research —

### Research Activities

My research interests center on AI for resource management in 5G/6G/beyond networks, game theory and distributed AI, digital twins, IoT, UAVs, and cybersecurity.

In my research endeavors, I concentrate on diverse applications addressing key challenges. This includes optimizing the use of natural resources like water and energy, implementing sustainable agricultural practices for eco-friendly farming, and developing robust communication protocols for efficient and secure interactions among Autonomous Vehicles (AV), Connected Vehicles (CV), Unmanned Aerial Vehicles (UAV), and Internet of Things (IoT) devices. Additionally, I explore intelligent solutions for smart city planning and management, particularly in terms of urban mobility, and analyze the impact of climate change on various sectors, developing adaptive measures. Furthermore, I focus on resource management in complex environments, devising strategies for optimal utilization. Leveraging Artificial Intelligence (AI), these research directions aim to contribute significantly to addressing major challenges in sustainability, smart connectivity, cybersecurity and comprehending environmental changes...

Here are some areas of my research:

- **Performance Evaluation and Resource Management in Networks**
- **Machine learning and artificial intelligence for wireless Mobile networks.**
- **Context-aware and 6G Mobile networks.**
- **Federated Learning and Wireless Networks**
- **AI for UAV Communications and networking**
- **AI for Internet of Things**
- **AI for Autonomous Systems**
- **AI for Security**
- **Game theory and its applications.**
- **Cybersecurity and Digital Trust:**

- **Metaverse, Digital Twins & Extended Reality**

**Mathematical Tools:** Modeling: AI, Machine Learning, Deep Learning, Game Theory, MDP (Markov Decision Processes), Queueing Theory, Learning, ...

**Simulations & Experimentation:** Python, Matlab, Maple, NS3, Flower, IoT hardware, VR-AR,...

**Past Ph.D Student —**

**Doctoral thesis  
supervision**

| Student's Name         | Thesis Topic   | Defense date | Current Situation   |
|------------------------|--|--------------|---|
| Mohammed Amine Koulali | Wireless Sensor Networks: Geographic Routing Protocols with Quality of Service and Energy-Awareness  | 07/04/2012   | Associate Professor at ENSA, University Mohammed Premier, Oujda |
| Mouna Elmachkour       | Incentive Mechanisms for Efficient Self-Organizing and Green Cognitive Radio-based 5G Networks   | 26/03/2016   | Assistant Professor at Mohammed V University in Rabat           |
| Mabrouk Abdelfattah    | Incentive Mechanisms for Efficient Routing and Internet Access in Vehicular Ad-Hoc Networks  | 29/07/2016   | Associate Professor at EST Settat                               |
| Abdelaziz Walid        | Exploiting Heterogeneity in the Development of the Next Generation 5G Mobile Networks  | 29/10/2016   | Assistant Professor at ENSA, Ibn Zohr University, Agadir        |
| Hassan Bennani         | Novel Mechanism to Achieve QoS in Virtual-MIMO Systems: A Game Theoretical Analysis  | 25/07/2018   | Expert Manager at ADD, Rabat                                    |
| Omar AIT OUALHAJ       | Autonomic Delay tolerant networks for the Internet of Things Communications: Game Theory and Markov Decision Processes                                     | 05/03/2019   | Assistant Professor at l'INPT, Rabat                            |
| Bouchaib Assila        | Contribution to improve Ultra-Reliable Low-Latency Communication exploiting caching in Fog-Computing-Networks: Pricing model based on Game theory approach | 07/04/2021   | Entrepreneur  |
| Safae Lhazmir          | Autonomic Approaches based on Game Theory and learning Algorithms for Energy-efficiency in Internet of Things  | 20/04/2021   | Post-Doc at UIR   |
| Amine Abouaomar        | Resource Allocation in Mobile Edge Computing Network Environments (en cotutelle avec l'Université de Sherbrooke, Canada)                                   | 12/11/2021   | Assistant Professor at Alakhawen University                     |
| Mohamed Aymane AHAJJAM | MONITORING, CLASSIFICATION, FORECASTING OF ELECTRICITY CONSUMPTION FOR SMART GRIDS   | 06/12/2021   | Post-Doc at University of North Dakota, USA                     |
| Meriam Amine           | Dynamic Resources Management in Heterogeneous Networks for 5G and Next-Generation Technologies   | 16/04/2022   | Assistant Professor at EMSI- Rabat                              |
| Yassine Ben-Aboud      | Edge optimizations in the internet of things for Urban Monitoring and quality of life enhancement  | 08/09/2022   | Assistant Professor at ENSIAS-Rabat                             |
| Ihsane GRYECH          | Microgrid data analysis and energy inefficiencies detection using unsupervised learning.   | 21/01/2023   | Postdoctoral Researcher - KU Leuven, Belgium                    |
| Chaimae Boudagdigue    | Trust In IoT (en cotutelle avec Université d'Avignon France)   | 15/03/2023   | ATER, University of Avignon france                              |

## Research Projects

| Project Title   | Type   | Duration               | PI                    |
|---|--|------------------------|-----------------------|
| ANGEL: Agriculture Numérique et “diGital twin” face aux changEments climatiques pour une sécurité aLimentaire | PHC- MAGHREB (France, Maroc, Tunisie)  | 3 years<br>2024-2027   | Pr.Abdellatif Kobbane |
| Risk-aware Engineering: A Large-scale Investigation (REAL-I)  | Al-Khawarizmi Program for Supporting Research in the Field of Artificial Intelligence and its Applications | 3 years<br>2020-2023   | Pr.Abdellatif Kobbane |
| Déploiement des réseaux de cinquième génération (5G) dans un contexte smart cities                            | Research Project under the Cooperation Framework, Project No. 17TM25, Morocco and Tunisia                  | 3 years<br>(2017-2019) | Pr.Abdellatif Kobbane |
| REseaux DTN Pour les enviroNNements à circonStances critiquES : Cas des évènements culturels de type festival | Integrated Action Project, Faculty of Sciences Rabat, ENSIAS, and University of Avignon, France            | 3 years<br>(2011-2014) | Pr.Abdellatif Kobbane |

## Patents —

## Scientific Outreach

| Authors  | Title of Patent (OMPIC)  | Date       |
|--|--|------------|
| KOBBANE Abdellatif<br>BENNANI Hassan<br>SABIR Essaid<br>RACHIDI Mustapha   | <b>Real-time Forecasting Method for Abandonment Rate Generated by an Automatic Call Distributor System</b>                                   | 31.01.2020 |
| El ouahabi Mohamed<br>Ghogho Mounir<br>Ahajjam Mohamed Aymane<br>Kobbane Abdellatif                              | <b>Mobile Augmented Reality Application for Intelligent Estimation of Electrical Appliance Consumption</b>                                   | 30.06.2020 |
| El ouahabi Mohamed<br>Ghogho Mounir<br>Ahajjam Mohamed Aymane<br>Kobbane Abdellatif<br>Bonilla Licea Daniel      | <b>Intelligent System for Instant Detection and Notification of Electrical Signal Quality Disturbances</b>                                   | 31.05.2021 |
| Mohamed Aymane Ahajjam<br>Mohamed El Ouahabi<br>Daniel Bonilla Licea<br>Mounir Ghogho<br>Abdellatif Kobbane      | <b>Intelligent System for Detection and Identification of Operating Devices using Non-intrusive Bimodal Electrical Signal Monitoring</b>     | 31.01.2022 |
| AHAJJAM, Mohamed Aymane<br>EL OUAHABI, Mohamed<br>BONILLA LICEA, Daniel<br>GHOGHO, Mounir<br>KOBBANE, Abdellatif | <b>INTELLIGENT SYSTEM FOR DETECTING AND IDENTIFYING APPLIANCES IN OPERATION BY NON-INTRUSIVE BIMODAL MONITORING OF THE ELECTRICAL SIGNAL</b> | 03.02.2022 |
| EL OUAHABI, Mohamed<br>GHOGHO, Mounir<br>AHAJJAM, Mohamed Aymane<br>ABDELLATIF, Kobbane<br>BONILLA LICEA, Daniel | <b>INTELLIGENT SYSTEM FOR IMMEDIATE DETECTION AND NOTIFICATION OF DISTURBANCES IN ELECTRICAL SIGNAL QUALITY</b>                              | 09.06.2022 |
| GRYECH, Ihsane<br>GHOGHO, Mounir<br>KOBBANE, Abdellatif  | <b>MONITORING AND WARNING METHOD FOR ASTHMATIC PATIENTS AND THEIR DOCTORS</b>  | 20.10.2022 |
| Ghogho Mounir<br>GRYECH IHSANE<br>KOBBANE ABDELLATIF   | <b>Method for monitoring and alerting asthmatic patients and their Doctors</b>   | 31.10.2022 |

- Keynote: "Resources Management in SDN-Mobile slicing," Polytechnic University of Hauts-de-France, France, September 20, 2023.
- Keynote: "Flexible Resources Management in Next Generation Networks," WCOS'22 Workshop at the Faculty of Sciences, Kenitra, June 20, 2022.
- Keynote: "Resources Management in 5G Mobile Networks," WNSN'22 Workshop in Khouribga, March 16, 2022.
- Seminar: "Flexible Resources Allocation in Future Networks," Smart Cities Institute, University of Pamplona, Spain, November 2022.
- Keynote: "Resources Management in 5G Networks: A Game Theory Approach," First School on Game Theory and Applications for Big Data, Cloud Computing, and Cybernetics, ENSA-Oujda, December 20, 2018.
- Keynote: "Resources Provisioning in 5G Mobile Communications Networks: New Trends and Challenges," RNJC-SI'18, FST, Fez, December 4, 2018.
- Keynote: "5G Mobile Wireless Networks: New Trends and Challenges," Alexandria, Egypt, April 24, 2018.
- Seminar: "5G Mobile Wireless Networks: New Trends and Challenges," UQAM, September 18, 2018.
- Seminar: "Caching Problem in 5G Networks," ENSI, Tunisia, March 13, 2017.

**Conferences** — Cofounded the first specialized conference on wireless mobile networks in Morocco: The International Conference on Wireless Networks and Mobile Communications (WINCOM) in 2013 with Professor Mohamed El Kamili, FSDM, Fès, Essaid Sabir, ENSEM Casablanca, Khalil Ibrahimi, FS, Kénitra. ([www.wincom-conf.org](http://www.wincom-conf.org))

**Liste des  
publications (147  
publications scopus)**

**(last 7 Papers)**

- 1- Boudagdigue, C., Benslimane, A., Kobbane, A., Liu, J.  
"Trust-Based Certificate Management for Industrial IoT Networks", *IEEE Internet of Things Journal*, 2023, 10(14), pp. 12867–12885, **Core Q1**
- 2- Filali, A., Nour, B., Cherkaoui, S., Kobbane, A.  
"Communication and Computation O-RAN Resource Slicing for URLLC Services Using Deep Reinforcement Learning", *IEEE Communications Standards Magazine*, 2023, 7(1), pp. 66–73, **Core Q1**
- 3- Berkani, S., Gryech, I., Ghogho, M., Guermah, B., Kobbane, A.  
"Data Driven Forecasting Models for Urban Air Pollution: MoreAir Case Study", *IEEE Access*, 2023, 11, pp. 133131–133142, **Core Q1**
- 4- Abouaoumar, A., Cherkaoui, S., Mlika, Z., Kobbane, A.  
"Service Function Chaining in MEC: A Mean-Field Game and Reinforcement Learning Approach", *IEEE Systems Journal*, 2022, 16(4), pp. 5357–5368, **Core Q1**
- 5- Ahajjam, M.A., Bonilla Licea, D., Ghogho, M., Kobbane, A.  
"Experimental investigation of variational mode decomposition and deep learning for short-term multi-horizon residential electric load forecasting", *Applied Energy*, 2022, 326, 119963 **Core Q1**
- 6- Kabbaj, H., Hanjri, M.E., Kobbane, A., El-Azouzi, R., Abouaoumar, A.  
"DistFL: An Enhanced FL Approach for Non Trusted Setting in Water Distribution Networks", *IEEE International Conference on Communications*, 2023, IEEE ICC 2023-May, pp. 2486–2491, **Core B**
- 7- El Hanjri, M., Kabbaj, H., Kobbane, A., Abouaoumar, A.  
"Federated Learning for Water Consumption Forecasting in Smart Cities", *IEEE International Conference on Communications*, 2023, IEEE ICC2023-May, pp. 1798–1803, **Core B**