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Curriculum vitae

Fatima Salahdine, Ph.D.

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Research Interest

LoRa, LoRaWAN, Federated learning, Artificial intelligence, Data analysis, Big data, Internet of things, Security, mobile edge computing, network slicing, Cognitive radio networks, Wireless communication and networking, communication theory, signal processing, virtual reality, blockchain systems, computer vision

Teaching Interest

Data communication and networking, wireless communication, cognitive radio networks, 5G networks, artificial intelligence, machine learning, digital systems, security and privacy, embedded systems, signal processing, image processing, performance computing, parallel and distributed computing, embedded computing systems, cloud and edge computing, human- computer interaction, computer vision

ACADEMIC PREPARATION

2020-Present: UNC Charlotte Multicultural Postdoctoral Fellow, Department of Electrical and Computer Engineering, University of North Carolina at Charlotte, NC, US
Project 1: Securing 5G wireless communications using machine learning
Project 2: LoRa and LoRaWAN scalability

Mentors: Dr. Asis Nasipuri (2021/2022), Dr. Tao Han (2020/2021) Award: **President's Postdoctoral Fellowship**, 2 years

2013-2018. Ph.D. Computer Science-Electrical Engineering, Communication Systems Department, National Institute of Posts and Telecommunications (INPT), Morocco Dissertation Title: Compressive spectrum sensing for cognitive radio networks
Advisors: Dr. Naima Kaabouch (UND, USA), Dr. Hassan El Ghazi (INPT)

Honors: Very Honorable

2015-2016. Fulbright Scholar, Affiliate, College of Engineering and Mines, University of North Dakota, Grand forks, ND, US
Project 1: Enhancing radio spectrum access in cognitive radio networks
Project 2: Compressive spectrum sensing for cognitive radio networks

Award: **Fulbright Scholarship**, 1 year

2010-2013. M.S. Computer Science-Electrical Engineering, INPT, Morocco Honors: First Class Honor
Award**: Excellence award**
GPA: 3.69

2008-2010. BSc. Physics and Engineering Science, Pre-engineering Classes, Morocco Honors: First Class Honor, 31/670 National Level

PROFESSIONAL EXPERIENCE

Aug. 2020 to Present. President's Postdoctoral Fellow. UNC at Charlotte
Subjects: Securing 5G wireless communications using machine learning, LoRa and LoRaWAN scalability

Feb. 2018 to Jul. 2020. Independent Researcher
Subjects: Sensing, cybersecurity, security of physical layer, and machine learning

Feb. -May. 2018. Instructor/Lecturer. INPT, Morocco.
Sept. 2013 -Jan. 2018. Graduate Research Assistant, INPT, Morocco.
Aug. 2015 to Jul. 2016. Fulbright Scholar, Electrical Engineering Department, UND, US **Jan. 2014 -Jul. 2015, Jan. 2017 to Dec. 2017**. Graduate Teaching Assistant, INPT, Morocco. **Feb. to Jun. 2013**. Internship, INGECYS Technologies, Rabat, Morocco
Jun. to Jul. 2012. Internship, Huawei Technologies Co. Ltd, Rabat, Morocco
Jun. to Jul. 2011. Internship, Ministry of communication, Morocco

TEACHING EXPERIENCE

2020-2021

Course: ECGR 6120/8120: Wireless Communications and Networking, Fall 2020
Electrical and Computer Engineering - UNC Charlotte
Notes: I was teaching lectures with Dr. Tao Han
Description: Introduction to 5G networks, security in 5G networks, artificial intelligence for 5G networks, network slicing, and security

Course: ECGR 4187/5187: Data Communications and Networking II, Fall 2020 Electrical and Computer Engineering - UNC Charlotte
Notes: I was intervening with Dr. Tao Han in this course

Course: ECGR 3123: Data Communications and Networking, Spring 2021 Electrical and Computer Engineering - UNC Charlotte
Notes: I was intervening with Dr. Tao Han in this course

2014-2018

Course Taught: Cognitive radio networks, 2017, 2018, INPT, Graduate level
Description: The course exposed students to cognitive radio networks, spectrum sensing, software defined radio, and compressive sensing

Course Taught: Software defined radio and USRP Labs, 2017, 2018, INPT, Graduate level Description: The course exposed students to software defined radio, building and installing USRP, USRP and GNU Radio interfacing, spectrum sensing techniques, and compressive spectrum sensing

Tools: USRP devises, antennas, GNU Radio software, Python

Course Taught: Analog and digital communication systems, 2014-2017, INPT, Description: The course exposed students to Modulation and demodulation AM/FM Tools: Oscilloscope, Spectrum analyzer, Communication trainers and demo systems

Course Taught: Deterministic signal processing, 2014, 2015, INPT, Undergraduate level Description: The course exposed students to deterministic signal processing and MATLAB coding for signal processing Tools: MATLAB software

Course Taught: Network troubleshooting, 2015, 2017, INPT, Undergraduate level Description: The course exposed students to network troubleshooting
Tools: Wireshark software, Riverbed Modeler software

Course Taught: Wireless network topology, 2017, INPT, Graduate level

Description: The course exposed students to wireless network topology Tools: NS2 software, NS3 software, Ubuntu distribution

Course Taught: LAN networks coding and simulation, 2014, INPT, Undergraduate level Description: The course exposed students to network coding fundamentals, creating LAN networks, coding LAN networks, and hub switching
Tools: Opnet software, Hub, Bridge, LAN Switch, LAN Router

STUDENT RESEARCH ADVISING

Co-advised the following students:

Ph.D. student, Mishra Lalan, "5G and IoT", UND, with Dr. Naima Kaabouch, 2019-Present

Ph.D. student, Salma Benazzouza, "Compressive spectrum sensing for secure cognitive radio", Hassan II University, with Dr. Awatif Hayar, Dr. Mohammed Ridouani, 2019-Present

Ph.D. student, Meryem Elkiyali, "Full Duplex communication", Hassan II University, with Dr. Awatif Hayar and Dr. Mohammed Ridouani, 2019-Present

Ph.D. student, Bouchra Laaziri, "Deconvolution using Bayesian networks and machine learning based compressive sensing", Cadi Ayyad University, 2018

MS graduate students, Design project, INPT 2014, 2017, Mohammadia School of Engineers 2017, National School of Applied Science 2017

AWARDS AND HONORS

2020-2022. President's Postdoctoral Fellowship, UNC at Charlotte, US
2018. Ph.D. Dissertation with Honors
2015-2016. Fulbright Scholarship Award, US Department of State, US
2013. Excellence award, National Agency of Telecommunications Regulation, INPT

METRICS (as of Aug 22, 2021)
Google Scholar: Number of citations: 534 citations, **h-index**: 10, **i10-index:** 10

PUBLICATIONS

Under Review Papers

1. Salma Benazzouza, Mohammed Ridouani, **Fatima Salahdine**, Awatif Hayar, "A novel secure cooperative cognitive radio network based on Chebyshev map," Signal Processing Journal, 2021
2. **Fatima Salahdine, Qiang Liu, Tao Han," Towards secure and intelligent network slicing for 5g and beyond," IEEE Open Journal of the Computer Society, 2021**
3. **Fatima Salahdine**, Tao Han, Ning Zhang, "5G, 6G, and Beyond: Recent advances and future challenges," Computer Communications Journal, 2021
4. **Fatima Salahdine**, Tao Han, Ning Zhang, "Security in 5G, 6G, and Beyond: Taxonomy, requirements, recent advances, and future challenges," Computer Communications Journal, 2021
5. **Fatima Salahdine,** Johnson Opadere, Qiang Liu, Tao Han, Ning Zhang, Shaohua Wu, "A survey on sleep mode techniques for ultra-dense networks in 5G and Beyond," Computer Networks Journal, 2020
6. **Fatima Salahdine**, Zakaria El Mrabet, and Naima Kaabouch, "Phishing attacks detection: a machine learning based approach," Journal of Information Security and Applications, 2020

Peer Reviewed Journal Papers

1. Salma Benazzouza, Mohammed Ridouani, **Fatima Salahdine**, Awatif Hayar, "Chaotic compressive spectrum sensing based on chebyshev map for cognitive radio networks," Symmetry Journal, vol. 13, no. 3, 429, 2021.
2. **Fatima Salahdine**, Naima Kaabouch, "Security threats, detection, and countermeasures for physical layer in cognitive radio network: A survey," Physical Communication Journal, Elsevier, vol. 39, 2020
3. **Fatima Salahdine,** Elias Ghribi, Naima Kaabouch, "A cooperative spectrum sensing scheme based on compressive sensing for cognitive radio networks," International Journal of Digital Information and Wireless Communications, vol. 9, no. 2, 2019
4. **Fatima Salahdine**, Naima Kaabouch, "Social engineering attacks: A survey," Future Internet, vol. 11, no. 4, 89, 2019
5. **Fatima Salahdine**, Naima Kaabouch, Hassan El Ghazi, "A Bayesian recovery with Toeplitz matrix for compressive spectrum sensing in cognitive radio networks," International Journal of Communication Systems, Wiley Online Library, vol., pp. 1-9, 2017
6. **Fatima Salahdine**, Naima Kaabouch, Hassan El Ghazi, "A Survey on compressive sensing techniques for cognitive radio networks," Physical Communication Journal, Elsevier, vol. 20, pp. 61-73, 2016

Peer Reviewed Conference Proceedings

1. Salma Benazzouza, Mohammed Ridouani, **Fatima Salahdine**, Aawatif Hayar, "A secure Bayesian compressive spectrum sensing technique based chaotic matrix for cognitive radio networks", International Conference on Information Assurance and Security, pp. 1-11, 2020
2. Maha R. A. Obedoza, Gloria Rodriguez, Amber Johnston, **Fatima Salahdine**, Naima Kaabouch, "Social engineering attacks a reconnaissance synthesis analysis," IEEE Annual Ubiquitous Computing, Electronics & Mobile Communication Conference, NY, USA, 2020

3. Youness Arjoune, **Fatima Salahdine**, Md. Shoriful Islam, Elias Ghribi, Naima Kaabouch, "A novel jamming attacks detection approach based on machine learning for wireless communication," International Conference on Information Networking, Spain, 2020
4. **Fatima Salahdine,** Elias Ghribi, Naima Kaabouch, "Metrics for evaluating the efficiency of compressing sensing techniques" International Conference on Information Networking, Spain, 2020
5. Salma Benazzouza, Mohammed Ridouani, **Fatima Salahdine**, Aawatif Hayar "A survey on compressive spectrum sensing for cognitive radio networks," IEEE Annual International Smart Cities Conference, Morocco, 2019
6. **Fatima Salahdine**, Naima Kaabouch, Hassan El Ghazi, "One-bit compressive sensing Vs. multi-bit compressive sensing for cognitive radio networks," IEEE International Conference on Industrial Technology, France, 2018
7. **Fatima Salahdine**, Naima Kaabouch, Hassan El Ghazi, "A survey on techniques for dealing with uncertainty in cognitive radio networks," IEEE Annual Computing and Communication Workshop and Conference, NV, USA, 2017
8. **Fatima Salahdine**, Naima Kaabouch, Hassan El Ghazi, "A real time spectrum scanning technique based on compressive sensing for cognitive radio networks," IEEE Annual Ubiquitous Computing, Electronics and Mobile Communication Conference, NY, USA, 2017
9. **Fatima Salahdine**, Naima Kaabouch, Hassan El Ghazi, "Bayesian compressive sensing with Circulant matrix for spectrum sensing in cognitive radio networks," IEEE Annual Ubiquitous Computing, Electronics and Mobile Communication Conference, NY, USA, 2016

10. **Fatima Salahdine**, Hassan El Ghazi, Naima Kaabouch, Wassim Fassi Fihri, "Matched filter detection with dynamic threshold for cognitive radio networks," IEEE International Conference on Wireless Networks and Mobile Communications, Morocco, 2015
11. Wassim Fassi Fihri, **Fatima Salahdine**, Hassan El Ghazi, Naima Kaabouch, "A survey on decentralized random access mac protocols for cognitive radio networks," International Conference on Advanced Communication Systems and Information Security, Morocco, 2015

Non-Peer Reviewed Papers
Fatima Salahdine, "Spectrum sensing techniques for cognitive radio networks" arXiv

preprint arXiv:1710.02668, 2017

Fatima Salahdine and Naima Kaabouch, "Development of compressive sensing techniques for wideband spectrum scanning in cognitive radio networks", Experimental Program to Stimulate Competitive Research Conference, EPSCoR, ND, USA, 2016

Fatima Salahdine, El Ghazi Hassan, Naima Kaabouch, "Enhancing radio spectrum access in cognitive radio networks," AMTIC scientific event, Morocco, Apr 2015

PROFESSIONAL SERVICE & POSITIONS

Service
2020-2021. AGEP NC Alliance: Institutional transformation model to increase minority stem doctoral student and faculty success, preparing for workshop for STEM students, UNCC

Conference organizing committee member and Program committee

2019-Present. International Conference on Networking, Information Systems & Security, Program committee member

2017. Event on information technology, organizing committee member, INPT, Morocco **2015**. GNSS workshop, organizing committee member, INPT, Morocco

2015. AMTIC scientific event, organizing committee member, INPT, Morocco

2015. 4th edition of Open Days, organizing committee member, INPT, Morocco

Journal Reviewer:

1. IEEE Transactions on Wireless Communications (IEEE TWC)
2. IEEE Transactions on Communications (IEEE TC)
3. IEEE Transactions on Vehicular Technology (IEEE TVT)
4. IEEE Transactions on Cognitive Communications and Networking
5. IEEE Signal Processing Letters
6. IEEE Access
7. IEEE Transactions on Engineering Management
8. IEEE Communications Letters
9. IEEE Internet of Things Journal
10. IEEE Photonics Journal
11. IEEE Transactions on Intelligent Transportation Systems
12. IEEE Transactions on Aerospace and Electronic
13. IEEE Sensors Letters
14. IEEE Transactions on Aerospace and Electronic Systems
15. Physical Communication
16. International Journal of Communication Systems (IJCS)

17. International Journal of Adaptive Control and Signal Processing 18. Digital Signal Processing (DSP)
19. SN Computer Science
20. EURASIP Journal On Wireless Communications and Networking 21. Wireless Personal Communications

22. Journal of Electrical And Computer Engineering
23. Journal of Sensors
24. Advances in Science, Technology and Engineering Systems Journal
25. Applied System Innovation
26. Arabian Journal for Science and Engineering
27. Canadian Journal of Electrical and Computer Engineering
28. Electronics Letters
29. Frontiers of Information Technology and Electronic Engineering
30. IETE Journal of Research
31. Indonesian Journal of Electrical Engineering and Computer Science
32. International Conference on Computer Science and Application Engineering 33. IoT - Open Access Journal of Internet of Things
34. IEICE Transactions on Communications
35. IEICE Transactions
36. IET Networks
37. IET Communications
38. IET Image Processing
39. Communications of the ACM
40. Symmetry

41. Electronics
42. Energies
43. Sensors
44. Applied Sciences
45. Computers
46. Healthcare
47. Mathematics
48. Sustainability
49. Technologies
50. Information
51. Micromachines

Conference Reviewer

1. International Conference on Networking, Information Systems and Security, 2019-2021, Morocco
2. IEEE PIMRC 2017, Canada
3. IEEE Sarnoff Symposium, 2016, 2017, 2018, USA
4. 15th International Symposium on Wireless Communication Systems, 2018, Portugal
5. International Conference on Advanced Systems and Emergent Technologies, 2018, 2019, Tunisia
6. IEEE International Conference on Communications (ICC), 2020, Ireland