

# Abdul Karim GIZZINI

Post-Doctoral Researcher  
Qualified MCF, CNU-61 (N° 22261366018)

R<sup>e</sup> Abdul-Karim-Gizzini

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IMT Nord Europe, Institut Mines-Télécom, Lille, France.

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## EDUCATION

- Jan. 2019 - Dec. 2021** **PhD in wireless communications | ETIS, UMR8051, CY Cergy Paris University, ENSEA, CNRS - France**  
Thesis title : Advanced Linear and Deep Learning based Channel Estimation Techniques in Doubly Dispersive Environments  
Funding : The ASIA Chair of Excellence Grant (PIA/ANR-16-IDEX-0008)  
Supervisors : Dr. Marwa Chafii and Prof. Aymeric Histace
- Oct. 2015 - Nov. 2017** **Master degree in computer and communication engineering (ME) | IUL University - Lebanon**  
Thesis title : Building Detection Using High Resolution Satellite Imagery  
Supervisor : Dr. Ali Ghandour
- Oct. 2010 - Jul. 2015** **Bachelor degree in computer and communication engineering (BE) | IUL University - Lebanon**  
Senior Project Title : Home Automation System with NFC and Raspberry Pi  
Supervisor : Dr. Jamal Haydar

## RESEARCH EXPERIENCE

- Jan. 2023 - Present** **Postdoctoral Researcher | IMT Nord Europe, Institut Mines-Télécom - France**  
Research context : End-to-end PHY implementation of the autonomous train application using the recent V2X technologies, mainly, the 5G New Radio (NR)  
Funding : Eco Train project  
Supervisors : Dr. Yahia Medjahdi and Prof. Laurent Clavier
- Jan. 2022 - Dec.2022** **Research Assistant | ETIS, UMR8051, CY Cergy Paris University, ENSEA, CNRS - France**  
Research context : Advanced AI Applications in Wireless Communications / explainable AI (XAI) for robust AI-based Image Processing Applications  
Funding (Jan. - Aug.) : The ASIA Chair of Excellence Grant (PIA/ANR-16-IDEX-0008)  
Funding (Sep. - Dec.) : ATER Position  
Outcomes : 2 journals and 1 conference paper  
Supervisors : Dr. Marwa Chafii and Prof. Aymeric Histace
- Jan. 2019 - Dec. 2021** **PhD Thesis | ETIS, UMR8051, CY Cergy Paris University, ENSEA, CNRS - France**  
Research context : Advanced Linear and Deep Learning based Channel Estimation Techniques in Doubly Dispersive Environments  
Outcomes : 5 journals and 5 conference papers  
Supervisors : Dr. Marwa Chafii and Prof. Aymeric Histace
- Jan. 2018 - Dec. 2018** **Research Assistant | GEOAI group, CNRS-L - Lebanon**  
Research context : Building Detection Using High Resolution Satellite Imagery  
Outcomes : 1 journal  
Supervisor : Dr. Ali Ghandour
- Nov. 2015 - Dec. 2017** **Masters Thesis Project | IUL University - Lebanon**  
Research context : Novel Object Detection Techniques Using High Resolution Satellite Imagery  
Outcomes : 1 journal and 2 conference papers  
Supervisor : Dr. Ali Ghandour
- Mar. 2015 - Aug. 2015** **Engineering Senior Project | IUL University - Lebanon**  
Title : Home Automation System with NFC and Raspberry Pi  
Supervisor : Dr. Jamal Haydar
- May. 2013 - Feb. 2015** **Engineering Mini Projects | IUL University - Lebanon**  
Project 1 : Study and Design of Optical Fiber Transport Network in Lebanon  
Project 2 : Hospitality Management IOS Application for Rafik Hariri University Hospital  
Project 3 : Automatic Irrigation System Based on Micro Controllers  
Project 4 : Robot Arm Control System Using Arduino, and LabView  
Project 5 : Java Based Electrical Monitoring System software

## TEACHING EXPERIENCE

Mar. 2023 - Apr. 2023 **Part-time Lecturer - 23 H | IMT Nord Europe, Institut Mines-Télécom - France**  
Understanding 5G

Sep. 2022 - Dec. 2022 **Lecturer (ATER) - 159 H | ENSEA - France**  
Network Administration  
Internet of Things (IoT)  
Digital Signal Processing II  
Digital Communications  
Matlab (refresher course)

Oct. 2020 - May. 2022 **Part-time Lecturer - 173 H | ENSEA - France**  
Network Administration  
Internet of Things (IoT)

📦 **Teaching Hours : [ Total : 355 H / Class : 64 H - TD : 16 H - TP : 267 H - Project : 8 H ]**

University	Course Name	Academic Level	Details	Period	Key words
IMT Institut Mines-Télécom	Understanding 5G	Engineering Cycle 2 <sup>nd</sup> year	Class : 6 H TP : 9 H Project : 8 H	2023	Wireless Channel, OFDM, MIMO, Diversity, V2X Communications, IEEE 802.11p, IEEE 802.11bd, LTE-V2X, 5G NR-V2X
ENSEA	Network Administration	Engineering Cycle 3 <sup>rd</sup> year	Class : 38 H TD : 6 H TP : 132 H	2020 - 2022	IPv4, IPv6, Subnetting, Switching, TCP, UDP, VLANs, Routing Protocols, QOS
ENSEA	Internet of Things (IoT)	Engineering Cycle 2 <sup>nd</sup> year	Class : 12 H TP : 48 H	2020 - 2022	IoT protocols, short range solutions, Zigbee, Thread, Bluetooth, IEEE 802.15.4, IoT compatibility with IPv6, 6LoWPAN, RoLL, CoAP, LPWAN, Sigfox, LoRa, LTE-M, NB-IoT, RFID, V2X Communications
ENSEA	Digital Signal Processing II	Engineering Cycle 2 <sup>nd</sup> year	Class : 8 H TD : 10 H TP : 48 H	2022	Sampling theorem, DTFT, Signal Spectrum, Spectrum Resolution, SNR, Digital filtering, Smothing, echo cancellation, Signal extraction from noise
ENSEA	Digital Communications	Engineering Cycle 3 <sup>rd</sup> year	TP : 24 H	2022	OFDM, Modulation, M-QAM, FFT, DMT communications, Waterfilling
ENSEA	Matlab (refresher course)	Masters (SIC)	TP : 6 H	2022	Programming logic, functions & loops, Image processing, Histogram representation, Linear filtering, Fourier transform

Teaching Coordinators : Prof. Arsenia Chorti and Dr. Laura Luzzi

## PROJECTS SUPERVISION, ROLES AND, MEMBERSHIPS

### 📁 Projects Supervision :

Mar. 2022 - Sep. 2022 **Engineering Training Supervision | GEO Group - CNRS-L - Lebanon**

Project title : Crop Detection and Classification Using Aerial Imagery

Student name : Mohammad Zahweh

Sep. 2021 - Jun. 2021 **Engineering Training Supervision | ENSEA - France**

Project title : Design, Security and Virtualization of an Infrastructure Using GNS3 VMware Simulator

Student name : Nada RAKRAKY

Mar. 2019 - Aug. 2019 **Masters Thesis co-supervision | ENSEA - France**

Project title : Machine Learning-based Channel Estimation for Wireless Communications

Student name : Habiboulaye Moumouni Kamaye

### 📋 Roles :

- > TPC member in IEEE ICC 2023, and COMSNETS 2023 conferences.
- > Reviewer for IEEE VTC (fall/spring) and IEEE GLOBECOM conferences.
- > Reviewer for IEEE transactions on vehicular communications, IEEE wireless communications / communications letters.

### 📄 Memberships :

- > IEEE Member.
- > IEEE VTS Member.

## LANGUAGES

- > English (fluent)
- > French (intermediate - B1)
- > Arabic (mother language)

## SKILLS

- > Signal Processing
- > Estimation and Detection Theory
- > Analog and Digital Communications
- > Artificial Intelligence (AI)
- > Image processing using Satellite Images
- > explainable AI (XAI)
- > Programming :

Matlab    vscode    Python    Keras  
Tensorflow    Pytorch    C    C++    Java

## REFERENCES

### Dr. Marwa Chafii

New York University (NYU) Abu Dhabi, UAE

@ marwa.chafii@nyu.edu

### Prof. Arsenia Chorti

ETIS - ENSEA, FRANCE

@ arsenia.chorti@ensea.fr

### Prof. Gerhard Fettweis

Vodafone chair mobile communications systems, GERMANY

@ fettweis@ifn.et.tu-dresden.de

### Dr. Yahia Medjahdi

IMT Nord Europe, Institut Mines-Télécom, FRANCE

@ yahia.medjahdi@imt-nord-europe.fr

### Prof. Aymeric Histace

ETIS - ENSEA, FRANCE

@ aymeric.histace@ensea.fr

### Dr. Laura Luzzi

ETIS - ENSEA, FRANCE

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### Dr. Ali Ghandour

CNRS-L, LEBANON

@ aghandour@cnrs.edu.lb


### Prof. Laurent Clavier

IMT Nord Europe, Institut Mines-Télécom, FRANCE

@ laurent.clavier@imt-nord-europe.fr

## RESEARCH COLLABORATIONS

### New York University Abu Dhabi

 2022 - Present

 Abu Dhabi, UAE

- > Collaborators : Dr. Marwa Chafii and Prof. Raed Shubair
- > References : [C8, J4, J6, J7, J9]

### Indraprastha Institute of Information Technology Delhi


 2020 - Present

 New Delhi, India

- > Collaborators : Dr. Sumit Darak
- > References : [J8]

### National Center for Remote Sensing (GEO Group - CNRS-L)

 2022 - Present

 Beirut, Lebanon

- > Collaborators : Dr. Ali Ghandour
- > References : [J1, J2, C1, C2]

### Technical University of Chemnitz


 2021

 Chemnitz, Germany

- > Collaborators : Dr. Shahab Ehsanfar
- > References : [C6, C7]

### National Institute of Telecommunications (Inatel)

 2021

 Santa Rita do Sapucaí, Brazil

- > Collaborators : Dr. Guilherme Aquino and Prof. Luciano Mendes
- > References : [J5]

- > Collaborators : Dr. Ahmad Nimr and Prof. Gerhard Fettweis
- > Research Visit (August 2020), Funded by GDR-ISIS, CNRS, France
- > References : [J2, J4, C3, C4, C5]

## 📖 PUBLICATIONS

### 📖 Peer-Reviewed Journals :

- J10 **A. K. Gizzini**, Yahia Medjahdi, Laurent Clavier, "Towards Explainable AI for Channel Estimation in Wireless Communications," IEEE Transactions on Vehicular Technology, 2023. (Status : Under Review).
- J9 **A. K. Gizzini**, M. Chafii, "RNN Based Channel Estimation in Doubly Selective Environments," Submitted to the IEEE Transactions on Wireless communications, 2022. (Status : Major Revision).
- J8 S. A. ul haq, **A. K. Gizzini**, S. Shrey, S. J. Darak, S. Saurabh, and M. Chafii, "Deep Neural Network Augmented Wireless Channel Estimation on System on Chip," Submitted to the IEEE Transactions on Very Large Scale Integration Systems, 2022. (Status : Minor revision).
- J7 **A. K. Gizzini**, M. Chafii, "A Survey on Deep Learning based Channel Estimation in Doubly Dispersive Environments," in IEEE Access, vol. 10, pp. 70595-70619, 2022.
- J6 **A. K. Gizzini** and M. Chafii, "Low Complex Methods for Robust Channel Estimation in Doubly Dispersive Environments," in IEEE Access, vol. 10, pp. 34321-34339, 2022.
- J5 G. Aquino, L. Mendes, T. Barbosa, M. Chafii, and **A. K. Gizzini**, "MUSA Grant-Free Access Framework and Blind Detection Receiver". Journal of Communication and Information Systems, 36(1), 119-127.
- J4 **A. K. Gizzini**, M. Chafii, A. Nimr, R. M. Shubair and G. Fettweis, "CNN Aided Weighted Interpolation for Channel Estimation in Vehicular Communications," in IEEE Transactions on Vehicular Technology, vol. 70, no. 12, pp. 12796-12811, Dec. 2021.
- J3 **A. K. Gizzini**, M. Chafii, A. Nimr and G. Fettweis, "Deep Learning Based Channel Estimation Schemes for IEEE 802.11p Standard," in IEEE Access, 2020.
- J2 A. Ghandour and **A. Jezzini**, "Building shadow detection based on multi-thresholding segmentation," Signal, Image and Video Processing (SIVP). vol. 13, issue. 2, pp. 349-357, 2019.
- J1 A. Ghandour and **A. Jezzini**, "Autonomous building detection using edge properties and image color invariants," Buildings. vol. 8, issue. 5, pp. 65, 2018.

### > 📖 Conference Proceedings :

- C8 **A. K. Gizzini**, M. Chafii, "Bi-RNN Based Channel Estimation in Doubly Selective Environments," IEEE International Conference on Communications (ICC), 28 May- 01 June 2023, Rome, Italy.
- C7 S. Ehsanfar, K. Moessner, **A. K. Gizzini**, M. Chafii, "Performance Comparison of IEEE 802.11p, 802.11bd-draft and a Unique-Word-based PHY in Doubly-Dispersive Channels," in : Proceedings of the IEEE Wireless Communications and Networking Conference (WCNC), 10 - 13 April 2022, Austin, USA.
- C6 **A. K. Gizzini**, M. Chafii, S. Ehsanfar and R. Shubair, "Temporal Averaging LSTM-based Channel Estimation Scheme for IEEE 802.11p Standard," in : Proceedings of the IEEE Global Communications Conference (GLOBECOM), 7 - 11 December 2021, Madrid, Spain.
- C5 **A. K. Gizzini**, M. Chafii, A. Nimr and G. Fettweis, "Joint TRFI and Deep Learning for IEEE 802.11p Channel Estimation," in : Workshops Proceedings of the IEEE Global Communications Conference (GLOBECOM), 7 - 11 December 2020, Taipei, Taiwan.
- C4 **A. K. Gizzini**, M. Chafii, A. Nimr and G. Fettweis, "Adaptive Channel Estimation based on Deep Learning," in : Proceedings of the IEEE 92nd Vehicular Technology Conference (VTC2020-Fall), 4 October - 30 November 2020.
- C3 **A. K. Gizzini**, M. Chafii, A. Nimr and G. Fettweis, "Enhancing Least Square Channel Estimation Using Deep Learning," in : Proceedings of the IEEE 91st Vehicular Technology Conference (VTC2020-Spring), 25 May - 31 July 2020.
- C2 A. Ghandour, H. Krayem and **A. Jezzini**, "Autonomous Vehicle Detection and Classification in High Resolution Satellite Imagery," in : Proceedings of the International Arab Conference on Information Technology (ACIT), Werdanye, Lebanon, 2018.
- C1 A. Ghandour and **A. Jezzini**, "Post-War Building Damage Detection," in : Proceedings of the 2nd International Electronic Conference on Remote Sensing (ECRS-2), 2018.