Mounia Hamidouche

Post-doc at IMT-Atlantique

— Professional Activities

Mar 2020- Post-doctoral Researcher at IMT-Atlantique, Brest, France

• Topic: Graph-based analysis of deep learning architectures

• Supervisors: Vincent Gripon, Lucas Drumetz and Bastien Pasdeloup

2017-Feb 2020 Graduate Research Assistant at EURECOM, Sophia Antipolis, France

• Topic: Spectral analysis of random geometric graphs and its applications

• Track: Probability theory, random graph and spectral graph theory

• Supervisors: Laura Cottatellucci and Konstantin Avrachenkov

Oct-Jul 2019 Visiting Scholar at University of Erlangen-Nuremberg, Erlangen, Germany

Apr-Jun 2018 • Spectral analysis of random geometric graphs

• Teaching assistant for a graduate course on machine learning

Apr-Sep 2017 Masters Internship at CentraleSupelec, Gif-sur-Yvette, France

• Downlink performance of dense antenna deployment in 5G wireless networks

• Supervisors: Mérouane Debbah and Ejder Bastug

Feb-Jun 2015 Internship at BNP-Paribas, Algiers, Algeria

• Liquidity risk management and transformation

Education

2017-Feb 2020 Ph.D in Communication Systems, EURECOM, Sophia Antipolis, France

• Topic: Spectral analysis of random geometric graphs and its applications

2016 MSc. in Applied Mathematics, Optimization, Paris-Saclay University, Palaiseau, France

• Coursework includes: Stochastic processes, convex and non convex optimization, stochastic optimization, game theory, machine learning, operations research

2013-2015 **MSc. in Operations Research,** University of Sciences and Technology Houari-Boumediene (USTHB), Algiers, Algeria

2010-2013 BSc. in Mathematics and Computer Science, Major: Operations Research, USTHB, Algiers, Algeria

Teaching

Mar-Jul 2020 Teaching assistant, IMT-Atlantique

• Combinatorial optimization with applications to networked systems - graduate level

Oct-Jan 2019 Teaching assistant, University of Erlangen-Nuremberg

• Machine learning for communications - graduate level

- Linear Regression, logistic regression

- Feed-forward neural networks, convolutional neural networks

Technical Skills

Programming Python, Pytorch, Matlab, Cplex, Latex, Adobe Illustrator

Languages French, English, Arabic, German (beginner) and Amazigh (mother tongue)

Scholarships and Awards

2020 **Carnot Télécom and Société Numérique Fellowship,** postdoctoral fellowship at IMT Atlantique on graph signal processing and deep learning

Oct-Dec 2018 German Academic Exchange Service (DAAD) Fellowship, awarded a DAAD fellowship to visit Erlangen-Nuremberg university during my Ph.D

2016 Paris-Saclay Scholarship (IDEX Paris-Saclay), awarded the international Masters scholarship for academic excellence from Paris-Saclay University

2015 Honorary Degrees Distinction for University Curriculum, awarded by USTHB, Algeria

Personal Interests

Reading, tennis, cycling, piano

Academic Services

Reviewer for:

- o IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (IEEE PIMRC)
- o IEEE International Workshop on Signal Processing Advances in Wireless Communications (IEEE SPAWC)
- IEEE Transactions on Wireless Communications (IEEE TWC)

Publications

- 1) K. Avrachenkov, L. Cottatellucci and **M. Hamidouche***, "Eigenvalues and Spectral Dimension of Random Geometric Graphs", 8th International Conference on Complex Networks and their Applications, Dec. 2019, Lisbon, Portugal.
- 2) M. Hamidouche, L. Cottatellucci and K. Avrachenkov, "On the Normalized Laplacian Spectra of Random Geometric Graphs", Journal of theoretical probability, second round review, 2019.
- 3) M. Hamidouche, L. Cottatellucci and K. Avrachenkov, "Spectral Analysis of the Adjacency Matrix of Random Geometric Graphs." 57th Annual Allerton Conference on Communication, Control, and Computing, Sep. 2019, Illinois, USA.
- 4) M. Hamidouche, L. Cottatellucci and K. Avrachenkov, "Spectral Bounds of the Regularized Normalized Laplacian for Random Geometric Graphs", 4th Graph Signal Processing Workshop, Jun. 2019, Minneapolis, USA.
- 5) M. Hamidouche, E. Bastug, J. Park, L. Cottatellucci, and M. Debbah, "Downlink Performance of Dense Antenna Deployment: To Distribute or Doncentrate?" in *IEEE 28th Annual International Symposium on Personal, Indoor, and Mobile Radio Communications (PIMRC)*, pp. 1-6, Oct. 2017, Montreal, Canada.

Preperit and Ongoing Work

- 1) M. Hamidouche, B. Pasdeloup, L. Drumetz and V. Gripon, "Few-shot Image Classification via Mean-shift and Graph Filter" To be submitted.
- 2) C. Lassance, M. Bontonou, **M. Hamidouche**, B. Pasdeloup, L. Drumetz, V. Gripon, A. Ortega "Graphs as Tools to Improve Deep Learning Methods", *Book Chapter*, in *preparation*.
- 3) M. Hamidouche, L. Cottatellucci and K. Avrachenkov, "Spectral Analysis of Random Geometric Graph", Book Chapter, To be submitted.
- 4) M. Hamidouche, L. Cottatellucci and K. Avrachenkov, "Clustering in Geometric Block Model", in preparation.

^{*}The authors are listed in the alphabetical order