Mounia Hamidouche

Post-doc at IMT Atlantique
Born on April 7th, 1992

Personal Information

Contact

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

Current Professional Activity

Mar 2020 - **Post-doctoral Researcher**

- ***IMT Atlantique***, *Bretagne-Pays de la Loire, Brest, France*
- **Supervisors:** Vincent Gripon, Bastien Pasdeloup, Lucas Drumetz
- **Subject:** Improve few-shot classification performance using graph signal processing techniques
- **Teaching:** Networked systems (Optimization techniques applied to real-word applications)

Academic Training

Oct 2016 - May 2020 **Ph.D. in Automatic, Signal and Image Processing**

- ***EURECOM***, *Sophia Antipolis, France*
- **Supervisors:** Laura Cottatellucci (EURECOM) and Konstantin Avrachenkov (INRIA)
- **Ph.D. topic:** Spectral analysis of random geometric graphs
- **Key words:** Random geometric graph, random matrix theory, probability theory, spectral dimension
- **Ph.D. defense: May 29, 2020**
- **Jury members:**
  - Prof. Laura Cottatellucci (FAU University, Germany) - Advisor
  - Dr. Konstantin Avrachenkov (Inria, Sophia Antipolis) - Co-advisor
  - Dr. Pierre Borgnat (CNRS, ENS Lyon) - Reviewer
  - Dr. Sergey Skipetrov (CNRS, Grenoble University) - Reviewer
  - Prof. Hocine Cherifi (Boulogne University) - Examiner
  - Prof. Dirk Slock (Eurecom, Sophia Antipolis) - Examiner

2015-2016 **MSc. in Applied Mathematics**

- ***Paris-Saclay University***, *Palaiseau, France*
- **Major:** Optimization
- **Courses:** Stochastic processes, convex and non convex optimization, stochastic optimization, game theory, machine learning, operation research

2013-2015 **MSc. in Operation Research**

- ***University of Sciences and Technology Houari-Boumediene (USTHB)***, *Algiers, Algeria*
- **Major:** Operation research, management, risk and negotiation

2010-2013 **BSc. in Mathematics and Computer Science**

- ***USTHB***, *Algiers, Algeria*
- **Major:** Operation research

Professional Activities

Oct-Jun 2019
Apr-Jun 2018
(1 year)

Visiting Scholar at University of Erlangen-Nuremberg, Erlangen, Germany

- Spectral analysis of the random graph's adjacency matrix
- 16 hours tutorial to introduce Machine Learning basics

Apr-Sep 2016

Master's Internship, CentraleSupelec, Gif-sur-Yvette, France

- **Topic:** Downlink performance of dense antenna deployment in 5G wireless networks
- **Supervisors:** Mérouane Debbah and Ejder Bastug
- **Key words:** Wireless networks, latency, spectral efficiency, stochastic geometry, 5G

Feb-Jun 2015

Internship at BNP-Paribas, *Algiers, Algeria*

- **Topic:** Study of statistical models for the problem of liquidity risk in the banks

Technical Skills

- **Programming:** Matlab, Python (numpy, scipy, sklean, ect), Pytorch, Java
- **data:** SQL
- **Solvers:** Cplex

Scholarships and Awards

2020 **NeurIPS competition,** *ranked 3rd runner-up,* predicting generalization in deep learning competition

2020, 2021 **Carnot Télécom and Société Numérique Fellowship,** *awarded a postdoctoral fellowship at IMT Atlantique for the project 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

Academic Services

Reviewer for:

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

Publications

[B1] 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 "Advances in Signal Processing: Reviews, Book Series, Vol. 2,", 2020*, Submitted.

[J1] **M. Hamidouche**, L. Cottatellucci and K. Avrachenkov, "On the Normalized Laplacian Spectra of Random Geometric Graphs", *Journal of theoretical probability, second round review*, 2019.

[C6] **M. Hamidouche**, B. Pasdeloup, L. Drumetz et V. Gripon, "Graph Filtering for Improving the Accuracy of Few-shot Transfer-Based Learning" *IEEE International Conference on Image Processing (ICIP), 2021*, Submitted.

[C5] C. Lassance, L. Béthune, M.Bontonou, **M. Hamidouche** and V. Gripon, "Ranking Deep Learning Generalization using Label Variation in Latent Geometry Graphs", *Neural Information Processing Systems (NeurIPS) Workshop*, 2020.

[C4] K. Avrachenkov, L. Cottatellucci and **M. Hamidouche***, "Eigenvalues and Spectral Dimension of Random Geometric Graphs", *IEEE International Conference on Complex Networks and their Applications*, Dec. 2019, Lisbon, Portugal.

[C3] **M. Hamidouche**, L. Cottatellucci and K. Avrachenkov, "Spectral Analysis of the Adjacency Matrix of Random Geometric Graphs." *IEEE Annual Allerton Conference on Communication, Control, and Computing*, Sep. 2019, Illinois, USA.

[C2] **M. Hamidouche**, L. Cottatellucci and K. Avrachenkov, "Spectral Bounds of the Regularized Normalized Laplacian for Random Geometric Graphs", *Graph Signal Processing Workshop*, Jun. 2019, Minneapolis, USA.

[C1] **M. Hamidouche**, E. Bastug, J. Park, L. Cottatellucci, and M. Debbah, "Downlink Performance of Dense Antenna Deployment: To Distribute or Doncentrate?" *IEEE Annual International Symposium on Personal, Indoor, and Mobile Radio Communications (PIMRC), pp. 1-6, Oct. 2017,* Montreal, Canada.

*The authors are listed in the alphabetical order