

Anas Barakat

Ph.D. Student

Paris
✉ anas.barakat@telecom-paristech.fr
 [anasbarakat](#)
 [anasbarakat](#)

Education

- october 2018– **Doctor of Philosophy Degree**, *IP Paris, Télécom ParisTech*, Paris, in preparation.
Dynamical study of optimization algorithms in random environments for Machine Learning.
Supervised by Pr. Pascal Bianchi and Pr. Walid Hachem.
- 2017–2018 **Master of Science in Data Science (M2)**, *Université Paris Saclay*, Paris, *Highest honors*.
International Masters program jointly operated by Ecole Polytechnique and Télécom Paris-Tech, in collaboration with ENSAE and Université Paris-Sud.
- 2015–2018 **Master of Science, Engineer Degree**, *Télécom ParisTech*, Paris, top 5% ranking.
Data Science, applied mathematics, advanced probabilities and statistics, stochastic calculus
- 2013–2015 **Preparatory classes**, *Lycée Stanislas*, Paris, France.
Post-secondary studies leading to the nationwide highly competitive exam for admission to a graduate-level Engineering School ("Grande Ecole"), Intensive courses of Mathematics and Physics
- 2013 **International Baccalaureate**, *Lycée Descartes*, Rabat, Morocco, *with high honors*.
Merit scholarship

Experience

- 10/2018– **Ph.D student**, *IP Paris, Télécom ParisTech*, Paris.
Dynamical study of optimization algorithms in random environments for Machine Learning.
Supervised by Pr. Pascal Bianchi and Pr. Walid Hachem.
- 4/2018-9/2018 **Research Internship**, *Télécom ParisTech*, Paris.
Studied adaptive optimization algorithms for Machine Learning applications.
Supervised by Pr. Pascal Bianchi and Pr. Walid Hachem.
Funded by the CNRS - Gaspard-Monge Computer Science Laboratory (LIGM), Paris-Est Marne-La-Vallée University.
- 3/2017 **Athens Program**, *Technical University of Delft*, Delft, Netherlands.
European Student Exchange
Implemented Finite Elements Algorithms to solve differential equations in MATLAB.
- 11/2016 **Athens Program**, *Technical University of Munich*, Munich, Germany.
European Student Exchange
Implemented failure probabilities computation for systems to estimate structural reliability (Monte-Carlo estimation) in MATLAB.

Publications

Anas Barakat and Pascal Bianchi. Convergence of the adam algorithm from a dynamical system viewpoint. *arXiv preprint arXiv:1810.02263*, 2018.

Anas Barakat and Pascal Bianchi. Convergence analysis of a momentum algorithm with adaptive step size for nonconvex optimization. 2019.

Anas Barakat and Pascal Bianchi. Convergence de l'algorithme adam du point de

vue des systèmes dynamiques. *GRETSI*, 2019.

Talks and Posters

- October 2019 **11th OPT Workshop on Optimization for Machine Learning 2019**, Vancouver, Canada.
Convergence Analysis of a Momentum Algorithm with Adaptive Step Size for Nonconvex Optimization, accepted paper as a poster
- October 17th 2019 **Journées annuelles du GdR MOA 2019**, INSA, Rennes, France.
Convergence and Dynamical Behavior of the ADAM Algorithm for Non Convex Stochastic Optimization, talk
- October 8th 2019 **MLAI workshop**, Télécom Paris, Paris, France.
Poster
- October 2nd 2019 **MLRW workshop**, Criteo, Paris, France.
Spotlight Talk and Poster
- September 12th 2019 **JDSE 2019**, Centrale Supélec, Gif-sur-Yvette, France.
Convergence of the ADAM algorithm from a Dynamical System Viewpoint, talk
- August 29th 2019 **GRETSI 2019**, Université de Lille, Lille, France.
Convergence de l'Algorithme Adam du Point de Vue des Systèmes Dynamiques, oral presentation of the paper
- August 5th 2019 **ICCOPT 2019**, TU Berlin, Berlin, Germany.
Poster, Convergence of the ADAM Algorithm from a Dynamical Systems Viewpoint
- June 24th 2019 **Data Science Summer School (DS3)**, Ecole Polytechnique, Palaiseau, France.
Poster, Convergence of the ADAM Algorithm from a Dynamical Systems Viewpoint

Teaching and Tutoring Experience

- 2018–2019 **Project of Research and Innovation for Masters**, Télécom ParisTech, Paris.
Supervised two 2nd year master students (Yuqing Wang and Zhengkang Shi) for their 6-months project in collaboration with the startup XLearn and evaluated their report and oral defense.
Subject: Development of an online job advising system : learning skill titles' relations based on users' profiles using Machine Learning methods.
- 2018–2019 **Optimization for Data Science**, Télécom ParisTech, Paris, SD-TSIA211, 12 hours.
Conducted exercises sessions, supervised lab sessions and graded final exam for 1st year master students (32 students).
- 2018–2020 **Statistics**, Télécom ParisTech, Paris, MDI220, 15 hours.
Conducted exercises sessions, evaluated students projects for 1st year master students (32 students) and corrected exams.
- 2018–2020 **Probabilities**, Télécom ParisTech, Paris, MDI104, 21 hours.
Gave a lecture on discrete Markov chains on finite spaces, conducted exercises sessions on integration and measure theory and graded final exams for 3rd year undergraduate students (30 students)
- 2018–2019 **Machine Learning**, Télécom ParisTech, Paris, MDI343-724, 15 hours.
Supervised lab sessions for Big Data Specialized Master students (120 students).
Topics: Rosenblatt's Perceptron, SGD, SVM classification and regression, ensemble learning.
- 2017–2018 **Tutoring**, Ecole Polytechnique, Paris.
Tutored 2nd year students (individually and group of 10) in computer science (INF421: Design and Analysis of Algorithms, INF441: Advanced Programming)

Projects

2017-2018 **Data challenges**, *Télécom ParisTech*, Paris.

- **Prediction of the watching duration of advertising videos** : Designed a learning model using XGBoost algorithm for prediction from data provided by Teads online advertising company.
- **Acoustic Scene Classification** : Ranked in the top 10 (/80) of a Kaggle-like data challenge consisting of multi-class classification, "environment" recognition from a set of 1170 audio files (30 seconds each one) corresponding to 15 classes, using neural networks in Python (scikit-learn, keras).
- **Gender classification** : Participated to a Kaggle-like data challenge consisting of predicting a person's gender using features extracted from his/her photo. Data were provided by Morpho company.

2015-2016 **Smart Green House**, *Télécom ParisTech*, Paris.

Participated to a one-year project with a team of seven students to design an autonomous greenhouse to take care of plants. Tested the structure and implemented the client-server communication.

6/2016 **Quality Tester of Random Generated Numbers**, *Télécom ParisTech*, Paris.

Implemented in Python a program with a graphical interface to estimate the quality of random generated numbers using algorithms based on statistics.

Scholarships

2018- **Ph.D funding**, *Mines-Télécom Institute (IMT)*.

Future & Disruptive technologies research program, awarded to top 5% students.

2015-2018 **Merit Scholarship**, *Moroccan Ministry of Higher Education, Scientific Research and Professional Training*.

for students who reached top french engineering and business schools ('Grandes Ecoles').

2013-2015 **'Excellence-Major' scholarship**, *Agency for French Education Abroad (AEFE)*.

for foreign (non french) students who passed a baccalaureate degree in French high school with highest honors and planned to pursue high-level studies in France.

Computer skills and certifications

Designed programs and implemented algorithms for data mining, statistical purposes, and machine learning concerns using Python (scikit-learn, numpy, scipy, pandas, keras, PyTorch), R, MATLAB, developed programs in Java, C++.

8/2017 **Machine Learning by Stanford University**, *online course*, coursera.

Work Experience

summer 2016 **Worker Internship**, *Algodonera Paso Viejo*, Cordoba, Argentina.

Assisted the textile production, delivered orders and received customers in a Spanish speaking environment.

Languages

Arabic Native

French Native

English Fluent (C2)

Spanish Working level (C1)

Working language

Experience in Argentina

Hobbies

- **Classical music** : violonist in the “Académie de Musique de Paris” orchestra conducted by Jean-Philippe Sarcos (50 musicians and more than 100 singers) since 2015, Music theory diploma and violin diploma (9 years).
- **Sports**: horseback riding (first certificate in galloping and jumping in 2010), Brown belt in Full Contact (combat sport) in 2008, Swimming in a professional club.