

# Belhal Karimi

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## Education

### Ecole Polytechnique, CMAP

PH.D. IN MACHINE LEARNING

Paris, FR

Oct. 2016 - Oct. 2019

- Nonconvex Optimization for Machine Learning: Algorithms, Analysis and Applications
- Member of the XPOP team (INRIA) focussing on statistics for life sciences
- Under the supervision of Marc Lavielle and Eric Moulines

### Mines Paritech, PSL ITI

MASTER OF SCIENCE

Paris, FR

Sept. 2015 - June 2016

- Main topics: Machine Learning, Computer vision, Optimization, Cognitive sciences

### CentraleSupélec, Supélec track

ENG. DEGREE

Paris, FR

Sept. 2011 - June 2015

- Semester at ESCP Europe: Master in Management. London Campus
- 3rd year at Telecom ParisTech, Master IREN: Economics and Innovation

## Skills

**Programming** Python (TF, Keras, Scikit-Learn), R (Package saemix), Stan, Matlab, SQL, LaTeX, Django, Javascript, HTML5, CSS  
**Languages** French: native, English: fluent, Spanish: advanced, Persian: native

## Experience

### Baidu Research

ML RESEARCHER

Beijing, CN

Jan. 2020 - Present

- Cognitive Computing Lab led by Dr. Ping Li
- Machine Learning, Nonconvex Optimization, Probabilistic Deep Learning

### Samsung AI

VISITING SCHOLAR

Moscow, RU

Jul. 2019 - Sept. 2019

- Bayesian Deep Learning: optimization and design
- Working with Dr. Dmitry Vetrov at the Samsung AI - HSE Lab (ANR-11-LABX-0056-LMH, LabEx LMH)

### INRIA

PH.D. CANDIDATE

Palaiseau, FR

Oct. 2016 - Oct. 2019

- Member of the XPOP team, INRIA & CMAP, focussing on Machine Learning for life sciences
- Nonconvex Optimization Methods for PK-PD modeling

### Freelance Contractor

DEEP LEARNING CONSULTANT

Paris, FR

Sept. 2017 - Present

- Popsy (classifieds): Category and Price prediction based on listing images (using a multi-output multi-class VGGNet)
- OuiCar (P2P car sharing): Damages detection on car pictures (using a Mask R-CNN)

### Massachusetts Institute of Technology, MIT

VISITING SCHOLAR

Boston, USA

Jan. 2016 - Jul. 2016

- Machine Learning research, Brain and Cognitive Sciences department, ProbComp Lab. Working on MCMC methods and diagnostic tools. Collaboration with the Gates Foundation. Under the supervision of Vikash Mansinghka.

### Avolta Partners

M&A ANALYST

Paris, FR

Mar. 2015 - Sep. 2015

- Writing of Information Memorandum and Business Plan for high-tech startups (A and B series)
- Analysis on fundraising data in France (Time-to-next series, average first series amount, etc.)

### Rocket Internet

GLOBAL VENTURE DEVELOPER

Paris, FR

Feb. 2014 - Aug. 2014

- Launching Lamudi/Carmudi in 20+ African countries
- Expansion team, helping Business Intelligence team with performance reports

## Research Articles

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### A fast Stochastic Approximation of the EM for nonlinear mixed effects models

B. KARIMI, M. LAVIELLE AND E. MOULINES

- Computational Statistics and Data Analysis (CSDA), Volume 141, January 2020, p. 123-138

### On the Global Convergence of Fast Incremental EM Methods

B. KARIMI, HOI-TO WAI, MARC LAVIELLE AND E. MOULINES

- Advances in Neural Information Processing Systems (NeurIPS 2019), 2833-2843, Vancouver, CA.

### Non-asymptotic Analysis of Biased Stochastic Approximation Scheme

B. KARIMI, HOI-TO WAI, B. MIAOJEDOW AND E. MOULINES

- Conference On Learning Theory (COLT 2019), Phoenix, USA.

### On the Convergence Properties of the Mini-Batch EM and MCEM Algorithms

B. KARIMI, M. LAVIELLE AND E. MOULINES

- HAL preprint hal: 02334485, 2019

### MISSO: Minimization by Incremental Stochastic Surrogate for large-scale nonconvex Optimization

B. KARIMI AND E. MOULINES

- Bayesian Deep Learning Workshop (NeurIPS 2018), Montreal, CA.

### Efficient Metropolis-Hastings sampling for nonlinear mixed effects models

B. KARIMI AND M. LAVIELLE

- International Conference on Bayesian Statistics in Action (BAYSM 2018), p. 85-93, Warwick, UK.

### Non linear Mixed Effects Models: Bridging the gap between Independent Metropolis Hastings and Variational Inference

B. KARIMI, M. LAVIELLE AND E. MOULINES

- Implicit Models Workshop (ICML 2017), Sydney, AU.

## Talks and Posters

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### Nonconvex Optimization for Latent Data Models

BAIDU RESEARCH (BEIJING, SEATTLE, SUNNYVALE)

### Fast Incremental EM Methods

NEURIPS 2019 (VANCOUVER, CANADA)

### An Incremental and An Online Point of View of Nonconvex Optimization

SAMSUNG AI CENTER (MOSCOW, RUSSIA)

### MISSO Scheme

NEURIPS 2018: BAYESIAN DEEP LEARNING WORKSHOP (MONTREAL, CANADA)

### Some Accelerations of MLE Algorithms

COMPSTATS 2018 (IASI, ROMANIA)

### Inference in mixed effects models

FACEBOOK HQ (PARIS, FRANCE)

### HBGDki studies with BayesDB (Poster)

MCGOVERN INSTITUTE (BOSTON, USA)

## Software

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### Saemix: Open Source R Package for Nonlinear Mixed Effects Models

MAIN CONTRIBUTOR

- Project Website [saemixr.github.io](https://saemixr.github.io)
- Developing features and extensions in R code [github.com/saemixdevelopment](https://github.com/saemixdevelopment)
- Project R Bookdown [saemixdevelopment.github.io](https://saemixdevelopment.github.io)
- Ongoing Chan Zuckerberg Initiative funding application.

## Awards

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2019	<b>Jacques Hadamard Researcher Grant</b> , Samsung AI - HSE Lab visiting scholar grant	<i>Moscow, RU</i>
2019	<b>Student travel award</b> , COLT Conference	<i>Phoenix, USA</i>
2018	<b>Young researcher travel award</b> , BAYSM Conference	<i>Warwick, UK</i>
2017	<b>Jacob Startup Competition</b> , Agora Pitch, 4th place	<i>Bremen, DE</i>

## Teaching

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2017-2018	<b>MAP534: Machine Learning</b> , Msc Ecole Polytechnique-HEC	<i>Palaiseau, FR</i>
2017-2018	<b>MAP535: Regression</b> , Msc Ecole Polytechnique-HEC	<i>Palaiseau, FR</i>
2017-2018	<b>Bayesian Statistics</b> , Msc Data Science Ecole Polytechnique	<i>Paris, FR</i>
2018	<b>Innovation &amp; Technology</b> , 3A Ecole Polytechnique	<i>Palaiseau, FR</i>

## Extracurricular Activity

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<b>Entrepreneurship</b>	Agora: Detecting flaws at scale on images. <a href="http://get-agora.com/">http://get-agora.com/</a>
<b>Sports</b>	Basket-ball, Surf, Skateboard, Soccer
<b>Fun</b>	Fashion (needlepoint), Music production (Maschine), Reading (Sociology)