

# Augustin Cosse

Ecole Normale Supérieure,  
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Paris 75005, FR.  
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**Research Interests** Convex optimization, machine learning, large scale optimization and big data, compressed sensing, numerical analysis, algorithms and complexity, inverse scattering and wave propagation.

**Employment (Present)** **Ecole Normale Supérieure**, Paris  
Postdoctoral Fellow, Nov. 2017 - present.  
Département de Mathématiques et Applications (DMA).  
(2019 - present) CNRS.  
(2017 - 2019) Fondation Sciences Mathématiques de Paris

**New York University**, Paris, FR.  
Lecturer, CSCI-UA 9473 - Introduction to Machine Learning,  
CSCI-UA 9472 - Artificial Intelligence  
(Sept. 2018 - present.)

**Employment (Past)** **New York University**, New York, NY.  
Visiting Postdoctoral Fellow, Oct. 2016 - Oct. 2017  
Courant Institute of Mathematical Sciences and Center for Data Science.  
Francqui Foundation Fellow

**Education** **The University of Chicago**, Chicago, IL.  
Invited student, Sept. 2015 - Sept. 2016  
Department of Statistics.

**Harvard University**, Cambridge, MA.  
Fellow, Sept. 2014 - July 2015  
Institute for Applied Computational Science, School of Engineering.

**Massachusetts Institute of Technology**, Cambridge, MA.  
Invited graduate student, Sept. 2013 - Sept. 2014  
Imaging and Computing Group, Department of Mathematics.  
*FNRS travel grant, MISTI grant, MITEI fund*  
Activities : MIT sailing club, MIT soccer, MIT rowing club, MIT MUN

**Université Catholique de Louvain**, Louvain-la-Neuve, Belgium  
PhD in Engineering (EECS and Applied Math.), 2012 - 2016  
Image and Signal Processing Group, ICTEAM Institute.  
Supervisors : Laurent Demanet, Laurent Jacques

**Ecole Polytechnique de Louvain**, Louvain-la-Neuve, Belgium  
M.Eng Mathematical Engineering, 2009 - 2011  
2010 - 2011 : *Summa cum laude* (ranked first in mathematical engineering)  
2009 - 2010 : *Magna cum laude*  
Signal Processing, Modeling and simulation in physics

- Publications**
- A. Cosse and L. Demanet, Stable rank-one matrix completion is solved by the level-2 Lasserre relaxation, *Foundations of Computational Mathematics* (FOCM), 2018.
- A. Cosse, From blind deconvolution to blind super-resolution through convex programming, *under revision*, 2017.
- A. Cosse, Compressed super-resolution I : Maximal rank Sum-of-Squares, *preprint arXiv :2001.01644*, 2019.
- Proceedings**
- A. Cosse, A note on the blind deconvolution of multiple sparse signals from unknown subspaces, in *Proc. SPIE Optical Engineering + Applications conference on Wavelets and Sparsity XVII*, 2017.
- A. Cosse, L. Demanet, Rank-one matrix completion is solved by the sum-of-squares relaxation of order two, in *Proc. IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing* (CAMSAP 2015)
- A. Ahmed, A. Cosse, L. Demanet, A convex approach to blind deconvolution with diverse inputs, in *Proc. IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing* (CAMSAP 2015)
- A. Cosse, S. D. Shank, L. Demanet, A short note on rank-2 relaxation for waveform inversion, in *Proc. of the Society of Exploration Geophysicists (SEG), annual meeting* 2015.
- K. Alkhalifeh, A. Cosse, C. Craeye, B. Macq, Microwave Imaging From Wheel-of-Time Data, in *Proc. 8th European Conference on Antennas & Propagation*, (EUCAP 2014).
- A. Cosse, Diffeomorphic surface-based registration for MR-US fusion in prostate brachytherapy, in *Proc. IEEE 20th Mediterranean Electrotechnical Conference* (MELECON 2012).
- Awards/Grants**
- AFOSR/EOARD Research Grant FA9550-18-1-7007, 2018-2021  
 “Error quantification and complexity limits in deep learning”  
 Fondation Sciences Mathématiques de Paris (FSMP) Fellow 2017-2019.  
 Francqui Foundation Fellow 2016-2017  
 Travel Award, Hausdorff Institute for Mathematics, Bonn, DE.  
 Belgian National Science Foundation Research Fellow, 2014-2016  
 MISTI (MIT International Science and Technology) Grant, 2013  
 Belgian National Science Foundation (FNRS) Travel Grant, 2013  
 Belgian National Science Foundation Research Fellow, 2012-2014  
 IEEE Region 8 Best Paper Award (3rd place), 2012  
 IEEE UCL Student Chapter Best Thesis Award, 2011  
 FFJM, SCM and Véolia award for optimizing a public transport network, 2009
- Teaching**
- Lecturer for CSCIUA 9473 - Introduction to Machine Learning, NYU Paris.  
 Fall 2018, Spring 2019, Fall 2019, Spring 2020, Fall 2020.  
 Lecturer for CSCIUA 9472 - Artificial Intelligence, NYU Paris.  
 Fall 2020.  
 Substitute teacher for STAT/MATH37760 (Modern Signal Processing)  
 STAT31100 (Numerical Methods for PDEs)  
 The University of Chicago, Statistics, 2015 - 2016.  
 TA Project in Electronics (UCL, LSM, Graduate) 2011, 2012  
 TA Engineering Project II (UCL, EPL, Undergraduate) 2012, 2013

**Reviewing activities** IEEE, 2017 International Conference on Sampling Theory and Applications  
IEEE, 2013 International Conference on Sampling Theory and Applications  
Journal of Fourier Analysis and Applications  
IEEE Transactions on Image Processing  
International Conference on Machine Learning (ICML).  
AIMS Mathematical Control and Related Fields (MCRF)

**Research Stays** Hausdorff Research Institute for Mathematics (HIM), Bonn, Germany, January 2016, Trimester Program on the Mathematics of Signal Processing

**Invited Talks** LAAS/ENSEEIH/ENAC, Toulouse FR, Optimization Seminar, 2020.  
TU München, Workshop on Mathematical Signal and Image Analysis, 2019  
Ecole Normale Supérieure, FR, Laplace Reading Group, 2018.  
University of Delaware, DE, Inverse problems and Analysis Seminar, 2017.  
SPIE Wavelets and Sparsity, San Diego, CA, 2017.  
Courant Institute, NYC, Harmonic Analysis Seminar, 2017.  
Université Catholique de Louvain, BE, Applied Math Seminar, 2016.

**Programming** Matlab, Python, C (past experience in Java)

**Languages** **French** : Native  
**English** : Fluent  
**Dutch** : Intermediate