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1 Current position and experience

September 2019- | Maître de conférences (Associate professor, granted tenure in September 2020)
Université Paris-Dauphine
Université PSL
Paris, France
Faculty in the MIDO (Maths & Computer Science) department
Researcher in the LAMSADE unit, within the MILES (Machine Intelligence and Learning Systems) team

1.1 Previous positions

November 2016-August 2019 | Postdoctoral research associate in Optimization
Data Science Hub
Wisconsin Institute for Discovery
University of Wisconsin-Madison
Madison, WI, USA
Principal Investigator: Stephen J. Wright.

October 2013-October 2016 | Doctoral researcher in Applied Mathematics
Institut de Recherche en Informatique de Toulouse (IRIT)
Toulouse, France.

October 2013-September 2016 | Teaching assistant under doctoral grant
École Nationale Supérieure d'Électrotechnique, d'Électronique, d'Informatique, d'Hydraulique et des Télécommunications (ENSEEIH)
Toulouse, France.

1.2 Internships

February-April 2016	Visiting scholar (<i>Thesis Parts Appointment</i>) <i>Argonne National Laboratory</i> <i>Lemont, IL, USA</i> Supervised by Stefan Wild and Jeffrey Larson.
March-September 2013	Stochastic optimization on direct-search methods <i>Universidade de Coimbra, Coimbra, Portugal</i> <i>IRIT, Toulouse, France</i> 3 rd -year ENSEEIHT internship.
January-March 2013	Improvement of the iterative resolution of the electromagnetic diffraction calculus with integral equations <i>Laboratoire PLAsma et Conversion d'Énergie (LAPLACE)</i> <i>Toulouse, France</i> 3 rd -year ENSEEIHT “long project” Collaboration of Computer Science and Electronics departments.
June-August 2012	Study of the injectivity domain of the prolate ellipsoid <i>Institut de Mathématiques de Bourgogne, Dijon, France</i> 2 nd -year ENSEEIHT internship.

2 Publications

Standard practice in my research area is to order the authors by alphabetical order. My name is underlined on every report or paper that would not conform to that rule.

2.1 Submitted preprints

1. L. Roberts and C. W. Royer, Direct search based on probabilistic descent in reduced spaces. Technical report arXiv:2204.01275, first version released on April 2022.
2. R. Chan--Renous-Legoubin and C. W. Royer, A nonlinear conjugate gradient method with complexity guarantees and its application to nonconvex regression. Technical report arXiv:2201.08568, first version released on January 2022.

2.2 International journals

1. E. Bergou, Y. Diouane, V. Kunc, V. Kungurtsev and C. W. Royer, A subsampling line-search method with second-order results. Accepted in *INFORMS Journal on Optimization*, 2021.
2. E. Bergou, Y. Diouane, V. Kungurtsev and C. W. Royer, A stochastic Levenberg-Marquardt method using random models with complexity results. *SIAM/ASA Journal on Uncertainty Quantification*, 10(1):507-536, 2022.
3. E. Bergou, Y. Diouane, V. Kungurtsev and C. W. Royer, A nonmonotone matrix-free algorithm for nonlinear equality-constrained least-squares problems. *SIAM Journal on Scientific Computing*, 43(5):S743-S766, 2021.
4. F. E. Curtis, D. P. Robinson, C. W. Royer and S. J. Wright, Trust-region Newton-CG with strong second-order complexity guarantees for nonconvex optimization. *SIAM Journal on Optimization*, 31(1):518-544, 2021.
5. C. W. Royer, M. O'Neill and S. J. Wright, A Newton-CG algorithm with complexity guarantees for unconstrained optimization. *Mathematical Programming*, 180:451-488, 2020 (published online in January 2019).
6. S. Gratton, C. W. Royer, L. N. Vicente and Z. Zhang, Direct search based on probabilistic feasible descent for bound and linearly constrained problems. *Computational Optimization and Applications*, 72(3):525-559, 2019. *COAP Best paper prize for 2019*.
7. S. Gratton, C. W. Royer and L. N. Vicente, A decoupled first/second-order steps technique for nonconvex nonlinear unconstrained optimization with improved complexity bounds. *Mathematical Programming*, 179(1):195-222, 2020 (published online in September 2018).
8. C. W. Royer and S. J. Wright. Complexity analysis of second-order line-search algorithms for smooth nonconvex optimization. *SIAM Journal on Optimization*, 28(2):1448-1477, 2018.
9. S. Gratton, C. W. Royer, L. N. Vicente and Z. Zhang, Complexity and global rates of trust-region methods based on probabilistic models. *IMA Journal of Numerical Analysis*, 38(3):1579-1597, 2018 (published online August 2017).
10. S. Gratton, C. W. Royer and L. N. Vicente, A second-order globally convergent direct-search method and its worst-case complexity. *Optimization: A Journal of Mathematical Programming and Operations Research*, 65(6):1105-1128, 2016.

11. S. Gratton, C. W. Royer, L. N. Vicente and Z. Zhang, Direct Search based on Probabilistic Descent. *SIAM Journal on Optimization*, 25(3):1515-1541, 2015.

2.3 Conference proceedings

1. L. Meunier, Y. Chevaleyre, J. Rapin, C. W. Royer and O. Teytaud, On averaging the best samples in evolutionary computation. In: Bäck T. et al. (eds) *Parallel Problem Solving from Nature - PPSN XVI*, Lecture Notes in Computer Science, 661–674, Springer, 2020.
2. J.-B. Caillaud and C. W. Royer, On the injectivity and nonfocal domains of the ellipsoid of revolution, *Geometric Control Theory and sub-Riemannian Geometry*, 73-86, Springer-Verlag, 2014.

2.4 PhD thesis

1. C. W. Royer, *Derivative-Free Algorithms based on Probabilistic and Deterministic Properties: Complexity Analysis and Numerical Relevance*, University of Toulouse, November 2016.

3 Conference talks and seminars

3.1 Invited plenary talks and seminars

1. C. W. Royer, *Numerical optimization with complexity guarantees for nonconvex data science*, Data Science seminar, Johns Hopkins University, Baltimore (MD, USA), March 2022. Based on joint works with R. Chan–Renous-Legoubin, F. E. Curtis, D. P. Robinson and S. J. Wright. (Invited by Christian Kümmerle in the department of Applied Mathematics and Statistics.)
2. C. W. Royer, *Optimization without derivatives in larger dimensions and across networks*, Michigan Institute of Data Science (MIDAS) seminar, University of Michigan, Ann Arbor (MI, USA), March 2022. Based on joint works with L. Roberts, E. Bergou, Y. Diouane and V. Kungurtsev. (Invited by Albert Berahas in the department of Industrial and Operations Engineering.)
3. C. W. Royer, *Optimization without derivatives in larger dimensions and across networks*, Lehigh Industrial and Systems Engineering Seminar Series, Lehigh University, Bethlehem (PA, USA), March 2022. Based on joint works with L. Roberts, E. Bergou, Y. Diouane and V. Kungurtsev. (Invited by the Industrial and Systems Engineering department.)
4. C. W. Royer, *Newton-Krylov techniques for nonconvex optimization*, Computational Maths Seminar (online), Australian National University, Canberra, Australia, October 2021. (Invited by Lindon Roberts.)
5. C. W. Royer, *Conjugate gradient techniques for nonconvex optimization*, ICML 2021 Workshop “Beyond first-order methods in machine learning systems”, held virtually. (Plenary speaker, invited by the organizers.)
6. C. W. Royer, *Convergence rates of stochastic derivative-free optimization methods based on probabilistic properties*, Derivative-Free Optimization Symposium, Kelowna (BC, Canada), initially planned in August 2020 (**postponed to 2022 due to the pandemic**). (Invited by the organizers.)

7. C. W. Royer, *Probabilistic properties in numerical optimization: Theoretical analysis and numerical relevance*, LAMSADE Seminar Series, Université Paris-Dauphine (Paris, France), May 2019. (Invited by Florian Yger and Jérôme Monnot.)
8. C. W. Royer, *Nonconvex optimization via Newton-CG methods with complexity guarantees*, Lehigh Industrial and Systems Engineering Seminar Series, Lehigh University, Bethlehem (PA, USA), March 2019. Based on joint works with M. O’Neill and S. J. Wright. (Invited by the Industrial and Systems Engineering department.)
9. C. W. Royer, *Nonconvex optimization with complexity guarantees: a Newton-CG approach*, APO seminar, Toulouse (France), January 2019. Based on joint works with M. O’Neill and S. J. Wright. (Invited by Serge Gratton.)
10. C. W. Royer, *Newton-Conjugate Gradient methods with complexity guarantees for nonconvex optimization*, Department of Mathematics and Industrial Engineering, École Polytechnique de Montréal, Montréal (QC, Canada), October 2018. (Invited by the department.)
11. C. W. Royer, *Probabilistic Analysis of Derivative-Free Methods*, LANS seminar, Argonne National Laboratory, Lemont (IL, USA), April 2016. Based on joint works with S. Gratton, L. N. Vicente, Z. Zhang. (Invited by Stefan Wild.)
12. C. W. Royer, *Probabilistic Analysis of Derivative-Free Methods*, WID-DOW seminar, University of Wisconsin-Madison, Madison (WI, USA), April 2016. Based on joint works with S. Gratton, L. N. Vicente, Z. Zhang. (Invited by Stephen J. Wright.)

3.2 Invited session/minisymposia talks

1. C. W. Royer, *Conjugate gradient methods for nonconvex optimization*, INFORMS Optimization Society meeting, Greenville, SC, USA, March 2022. (Invited by B. Zhou and A. Berahas).
2. C. W. Royer, *Newton-type methods with complexity guarantees*, INFORMS Annual Meeting, Anaheim, CA, USA (Hybrid format), October 2021. (Invited by B. Zhou).
3. C. W. Royer, *Trust-region Newton-CG with strong second-order complexity guarantees for nonconvex optimization*, SIAM Conference on Optimization (OP21), July 2021; **(Initially planned in Spokane, WA, USA, moved online due to the pandemic.)** Co-authors : F. E. Curtis, D. P. Robinson and S. J. Wright. (Invited by A. Berahas and R. Bollapragada.)
4. C. W. Royer, *A study of direct-search methods based on probabilistic properties*, 31st European Conference on Operational Research, Athens, Greece (Hybrid format), July 2021. (Invited as session organizer by A. L. Custódio.)
5. C. W. Royer, *A stochastic Levenberg-Marquardt method using random models*, 18th Workshop on Advances in Continuous Optimization (EUROPT), Toulouse (France), July 2021 **(held virtually due to the pandemic)**. Co-authors: E. Bergou, Y. Diouane and V. Kungurtsev. (Invited by S. Le Digabel and Y. Diouane.)
6. C. W. Royer, *Newton-type methods with complexity guarantees for nonconvex optimization*, LAMSADE Annual meeting, Université Paris Dauphine-PSL, May 2021. Based on joint works with M. O’Neill and S. J. Wright.

7. C. W. Royer, *A stochastic Levenberg-Marquardt Methods for Noisy Derivative-Free Optimization with Complexity Results and Application to Data Assimilation*, SIAM Conference on Computational Science and Engineering (CSE21), March 2021. **(Initially planned in Forth Worth, TX, USA, moved online due to the pandemic)**. Co-authors: E. Bergou, Y. Diouane and V. Kungurtsev. (Invited by J. Mueller and C. Shoemaker.)
8. C. W. Royer, *A decentralized derivative-free optimization method*, Optimization 2020, Aveiro (Portugal), initially planned in July 2020 **(cancelled due to the pandemic)**. Co-authors : E. Bergou, Y. Diouane and V. Kungurtsev. (Invited by G. Liuzzi.)
9. C. W. Royer, *Newton-Conjugate Gradient methods with complexity guarantees*, IMA Conference on Numerical Linear Algebra and Optimization, originally planned in June 2020 **(delayed to 2022 due to the Covid-19 situation)**. Based on joint works with F. E. Curtis, M. O’Neill, D. P. Robinson and S. J. Wright. (In a mini-symposium co-organized with E. Riccietti.)
10. C. W. Royer, *A decoupled first/second-order steps technique and its application to non-convex derivative-free optimization*, International Conference on Continuous Optimization, Berlin (Germany), August 2019. Based on a joint work with S. Gratton and L. N. Vicente. (Invited by A. L. Custódio and F. Rinaldi.)
11. C. W. Royer, *Complexity guarantees for practical second-order algorithms*, International Conference on Continuous Optimization, Berlin (Germany), August 2019. Based on a joint works with M. O’Neill and S. J. Wright. (Replacing S. J. Wright, invited by A. Berahas.)
12. C. W. Royer, *A stochastic Levenberg-Marquardt method using random models with application to data assimilation*, SIAM Computational Science and Engineering conference, Spokane (WA, USA), February-March 2019. Based on joint work with E. Bergou, Y. Diouane and V. Kungurtsev. (Invited by M. Menickelly and J. Mueller.)
13. C. W. Royer, *Using models in allocating and partitioning algorithms*, Conference ISMP 2018, Bordeaux (France), July 2018. Co-authors: J. Larson, S. M. Wild. (Invited by Y. Diouane and S. Wild).
14. C. W. Royer, *Complexity analysis of second-order line-search algorithms for smooth non-convex optimization*, 2018 INFORMS Optimization Conference, Denver (CO, USA), March 2018. Co-author: S. J. Wright. (Invited by A. Mokhtari, S. Paternain and A. Ribeiro in a session “Nonconvex optimization”).
15. C. W. Royer, *Complexity analysis of second-order line-search algorithms for smooth non-convex optimization*, Workshop “Beyond convexity: Emerging Challenges in Data Science”, Oaxaca (Mexico), October 2017. Co-author: S. J. Wright. (Invited by the organizers T. Kolda, R. Nowak, R. Willett and S. Wright).
16. C. W. Royer, *Including inexact second-order aspects in first-order methods for nonconvex optimization*, Optimization 2017, Lisbon (Portugal). Co-author: S. J. Wright. (Invited as session organizer by L. N. Vicente.)
17. C. W. Royer, *Direct search based on probabilistic feasible descent for bound and linearly constrained problems*, SIAM Conference on Optimization, Vancouver (Canada), May 2017. Co-authors: S. Gratton, L. N. Vicente, Z. Zhang. (Invited in the mini-symposia “Derivative-free optimization” chaired by Stefan Wild and Sébastien Le Digabel.)

18. C. W. Royer, *Direct Search using Probabilistic Descent*, Conference *ISMP 2015*, Pittsburgh (PA, USA), July 2015. Co-authors: S. Gratton, L. N. Vicente, Z. Zhang. (Invited by Zaikun Zhang.)
19. C. W. Royer, *Direct Search using Probabilistic Descent*, Conference *Optimization 2014*, Guimarães (Portugal). Co-authors: S. Gratton, L. N. Vicente, Z. Zhang. (Invited by Serge Gratton.)

3.3 Contributed talks

1. C. W. Royer, *Modern optimization tools (for naval engineering?)*, École Navale, Lanzéoc, France, October 2021.
2. C. W. Royer, *Newton-Conjugate Gradient methods with complexity guarantees*, SIAM Conference on Applied Linear Algebra, May 2021. **(Initially planned in New Orleans, LA, USA, moved online due to the pandemic)**. Based on joint works with M. O’Neill and S. J. Wright. (In a mini-symposium co-organized with E. Riccietti.)
3. C. W. Royer, *A stochastic Levenberg-Marquardt method using random models*, SMAI-MODE Days 2020, EDF Lab, Palaiseau (France), initially planned for March 2020 **(postponed to September 2020 due to the pandemic)**. Co-authors: E. Bergou, Y. Diouane, V. Kungurtsev.
4. C. W. Royer, *Newton-Conjugate Gradient methods with complexity guarantees*, PGMO Days 2019, EDF Lab, Palaiseau (France), December 2019. Co-authors: M. O’Neill, S. J. Wright.
5. C. W. Royer, *A decoupled first/second-order steps technique for nonconvex optimization*, MOPTA 2019, Bethlehem (Pennsylvania, USA), August 2019. Co-authors: S. Gratton, L. N. Vicente.
6. C. W. Royer, *Nonconvex optimization despite expensive, inexact or unavailable values*, SILO Seminar, University of Wisconsin-Madison, Madison (Wisconsin, USA), August 2019.
7. C. W. Royer, *Stochastic optimization with probabilistic properties: A case study for optimization under uncertainty?*, MACSER Optimization under Uncertainty Seminar, Madison (Wisconsin, USA), June 2019.
8. C. W. Royer, *Handling bad outcomes in derivative-free optimization with probabilistic properties* (Poster), ICERM Workshop on Mathematical Optimization of Systems Impacted by Rare, High-Impact Random Events, Providence (Rhode Island, USA), June 2019.
9. C. W. Royer, *Complexity guarantees and numerical behavior of Newton-type methods for smooth nonconvex optimization*, IMA Conference on Numerical Linear Algebra and Optimization, Birmingham (UK), June 2018. Co-authors: M. O’Neill, S. J. Wright.
10. C. W. Royer, *Numerical Optimization with Complexity Guarantees* (Poster), Autumn School on Optimization in Machine Learning and Data Science, Trier (Germany), August 2017.
11. C. W. Royer, *Complexity analysis of second-order line-search algorithms for smooth nonconvex optimization*, MOPTA 2017, Bethlehem (Pennsylvania, USA), August 2017. Co-author: S. J. Wright.

12. C. W. Royer, *Complexity and Global Rates of Optimization Methods based on Probabilistic Properties* (Poster), ACNTW Workshop, Chicago (Illinois, USA), May 2017. Co-authors: S. Gratton, L. N. Vicente, Z. Zhang.
13. C. W. Royer, *Probabilistic Feasible Descent Techniques for Derivative-Free Linearly Constrained Optimization*, 14th EUROPT Workshop, Warsaw (Poland), July 2016. Co-authors: S. Gratton, L. N. Vicente, Z. Zhang.
14. C. W. Royer, *Second-Order Convergence in Direct-Search Methods*, CIMI Workshop on Optimization with Application to Machine Learning & Data Assimilation, Toulouse, January 2016. Co-authors: S. Gratton, L. N. Vicente.
15. C. W. Royer, *Form First to Second-Order Quality Measures in Direct-Search Methods*, Days of the GDR MOA (CNRS), Dijon, France, December 2015. Co-authors: S. Gratton, L. N. Vicente.
16. C. W. Royer, *Form First to Second-Order Quality Measures in Direct-Search Methods*, APO PhD students day, Toulouse, November 2015. Co-authors: S. Gratton, L. N. Vicente.
17. C. W. Royer, *Form First to Second-Order Quality Measures in Direct-Search Methods*, 13th EUROPT Workshop, Edinburgh (UK), July 2015. Co-authors: S. Gratton, L. N. Vicente.
18. C. W. Royer, *Direct Search using Probabilistic Descent* (Poster), Workshop *Convex Optimization and Beyond*, Edinburgh (UK), 2014. Co-authors: S. Gratton, L. N. Vicente, Z. Zhang.
19. C. W. Royer, *Direct Search using Probabilistic Descent*, APO PhD students day, Toulouse, 2013 and 2014. Co-authors: S. Gratton, L. N. Vicente, Z. Zhang.
20. C. W. Royer, *Direct Search using Probabilistic Descent*, International Conference on Continuous Optimization, Lisbon (Portugal), 2013. Co-authors: S. Gratton, L. N. Vicente, Z. Zhang.

4 Funding and Awards

4.1 Funded projects

- GASCON: Towards new complexity analyzes in nonconvex optimization. Start-up project for newly recruited researchers and professors, INS2I, CNRS, France. Principal Investigator. Budget: 5000 €. Duration : February-December 2020, renewed for February-December 2021.
- SPEED: Simulating Physical PDEs Efficiently with Deep Learning. ANR (French Research Agency) Project involving four entities, member of the research team at LAMSADE (Coordinator: Lionel Mathelin). Budget: 426000 €. Duration: 2021-2024.

4.2 Funded positions

- PRAIRIE Springboard chair in optimization (2021-2024) funded through the French government. Allows for a reduced teaching load as well as one funded postdoctoral or doctoral position, in addition to 36000 € for operating costs.

- Postdoctoral position at the University of Wisconsin-Madison (2016-2019) partially funded through the DARPA-Lagrange project *Nonconvex Matrix Optimization: Geometry, Algorithms and Distributed Implementations*. Funding source: United States Department of Defense.
- Postdoctoral position at the University of Wisconsin-Madison (2016-2019) partially funded through the *MACSER: Multifaceted Mathematics for Rare, High-Impact Events in Complex Energy and Environment Systems* project, and its predecessor *M2ACS: Multifaceted Mathematics for Complex Energy Systems*. Funding source: United States Department of Energy.
- Teaching assistant fellowship (2013-2016) at the National Polytechnical Institute of Toulouse, France. Funding source: French Ministry of Higher Education and Research, through the Excellence Laboratory CIMI (International Center of Mathematics and Computer Science in Toulouse).
- *Doctoral fellowship “president quota”*: selective three-year thesis funding (2013-2016) from Université Toulouse III Paul Sabatier provided by its presidency. Funding source: French Ministry of Higher Education and Research.

4.3 Awards and financial support

- *COAP Best Paper prize 2019* for the paper *Direct search based on probabilistic feasible descent for bound and linearly constrained problems* published in the journal *Computational Optimization and Applications*.
- Support from ICERM (The Institute for Computational and Experimental Research in Mathematics, USA) to attend the workshop *Mathematical Optimization of Systems Impacted by Rare, High-Impact Random Events*, June 2019. Funding source: National Science Foundation through ICERM.
- *Best Poster Award* : delivered during the ALOP Autumn School of Trier University, August 2017. Travel support received from the Research Training Group ALOP.
- *Early Career Travel Award*: delivered by the Society of Industrial and Applied Mathematics (SIAM) to attend the SIAM Conference on Optimization, May 2017. Funding source: National Science Foundation through SIAM.

5 Additional research activities

5.1 Session organizing

- Session organizer for the 31st European Conference on Operational Research (EURO), to be held in Athens, Greece, in July 2021.
Topics: Derivative-free optimization.
Speakers: A. Berahas, E. Bergou, G. N. Grapiglia, V. Kungurtsev, A. Lucchi, C. W. Royer, G. Ughi.
- Mini-symposium organizer (with Elisa Riccietti) for the 2021 edition of the *SIAM Conference on Applied Linear Algebra*, initially planned in New Orleans, LA, USA, in May 2021. **Moved online due to the pandemic.**
Topic: Krylov methods in nonlinear optimization.
Speaker list: A. Monvoisin, E. Simon, E. Riccietti, C. W. Royer.

- Session organizer for the *ISMP 2018* conference held in Bordeaux, France.
Topic: Mixed-integer derivative-free optimization.
Invited speakers: A. R. Conn, U. García-Palomares, D. Sinoquet.
- Session organizer for the *Optimization 2017* conference in Lisbon, Portugal.
Topics: randomized methods, first-order algorithms with applications.
Invited speakers: G. Garrigos, R. M. Gower, J. Liang, V. Perchet, N. Pustelnik, S. Vaiter.

5.2 Reviewing

International journals:

- *SIAM Journal on Optimization* (9);
- *Computational Optimization and Applications* (4);
- *Optimization Methods and Software* (3);
- *Mathematical Programming* (2);
- *Optimization and Engineering* (2);
- *Applied Numerical Mathematics* (1);
- *ESAIM: Mathematical Modelling and Numerical Analysis* (1);
- *Journal of Global Optimization* (1);
- *Journal of Optimization Theory and Applications* (1);
- *Journal of Scientific Computing* (1);
- *Numerical Algorithms* (1);
- *Optimization Letters* (1).

International conferences:

- *International Conference on Machine Learning (ICML)*, 2019 (top 5% of reviewers) and 2020.
- *Conference on Learning Theory (COLT)*, 2018.
- *Neural Information Processing Systems (NeurIPS)*, 2018 (top 30% of reviewers).

5.3 Expertise

- Member of a Data Science and AI panel for the *Academy of Finland*, Finland in 2021.
- Expert for the *Fonds de recherche Nature et technologies*, Québec, Canada in 2019.

5.4 Committees

- Member of the Faculty Senate at Université PSL (January 2022-).
- Member of the Recruiting Committee at LAMSADE (January 2021-).

6 Supervision

6.1 Postdoctoral researcher

- FLORENTIN GOYENS, started January 2022 (Funding: French research agency via the PRAIRIE institute).

6.2 Graduate students

- SÉBASTIEN KERLEAU: PhD thesis at Université Paris Dauphine-PSL (Funding: Doctoral school SDOSE, French government scholarship), started October 2021. Co-supervised with Denis Cornaz.
- ISKANDER SABRI LEGHERABA: PhD thesis at Université Paris Dauphine-PSL (Funding: École Normale Supérieure fellowship), started September 2020. Co-supervised with Alexandre Allauzen.

6.3 Master students

- THOMAS GEORGES (Université Paris Dauphine-PSL): Master internship from June to September 2021.
- RÉMI CHAN-RENOUS-LEGOUBIN (Université Paris Dauphine-PSL): Master internship from April to July 2021.
- SÉBASTIEN KERLEAU (Université Paris Dauphine-PSL): Master thesis from April to September 2021. Co-supervised with Denis Cornaz.
- ISKANDER SABRI LEGHERABA (ENS Paris-Saclay): Master thesis from April to August 2020. Co-supervised with Alexandre Allauzen.

7 Teaching activities

7.1 Lectures and summer schools

- *Basic of smooth optimization, Convex optimization, Derivative-free and hyperparameter optimization*: three lectures for the *AI Project Manager* certificate of Université PSL, delivered to professionals from the car industry, November 2021.
- *Derivative-free optimization*: Lecture in the *Machine Learning and AI for Economics and Finance* PSL Summer School, June 2021.

7.2 Dauphine-PSL

Since 2019, I am a faculty member in the Mathematics and Computer Science department of Université Paris-Dauphine, a member of Université PSL. I am mostly involved in Master programs, both research-oriented and part-time (*apprentissage*), some of which involving multiple entities within PSL (Dauphine, ENS, Mines ParisTech, etc). I have also been involved in the new undergraduate programs on computer science and mathematics for decision and data (IM2D, IDD in French).

Current courses

2021-2022

Optimization for data and decision sciences

In charge of the course (lectures + tutorial sessions)

M2 MIAGE ID/ID Apprentissage (Master level)

2019-2022

Optimization for Machine Learning

In charge of the course (lectures + lab sessions)

M2 IASD Apprentissage (Master level)

2019-2022

Optimization for Machine Learning

Lecturer on gradient descent and nonconvex optimization (2021-2022)

Lecturer on stochastic gradient methods (2020-2022)

Lecturer on constrained optimization and second-order methods (2019-2020)

M2 IASD (Master level, computer science)

M2 MASH (Master level, mathematics)

2019-2022

Optimization for Machine Learning

2021-2022: In charge of the course and the lectures

2019-2021: In charge of the course (lectures+lab sessions)

M2 Big Data, Dauphine Tunis campus (Master level)

Past courses

2020-2021	<i>Optimization tools for data and decision sciences</i> In charge of the course (lectures + lab/tutorial sessions) <i>M2 MIAGE ID/IF/SITN (Master level)</i>
2020-2021	<i>Mathematics for Data Sciences</i> In charge of the course and the lectures <i>M1 IDD (Master level)</i>
2019-2021	<i>Fundamentals of Machine Learning</i> In charge of the course (lectures + lab sessions) <i>L3 IM2D (Bachelor/Undergraduate level)</i>
2019-2020	C++ In charge of the course and the lecture sessions <i>M1 Applied Mathematics (Master level)</i>

7.3 ENSEEIHT

From 2013 to 2016, I was a teaching assistant at the French engineering school ENSEEIHT, in the Computer Science and Applied Mathematics (IMA in French) department.

Fall Semesters

2013-2015

Parallel programming with OpenMP (Practical in C)

2013-2015

Numerical Optimization (Practical, Matlab project)
2nd year IMA (Master level)

2013-2014

Linear algebra (Practical, Introduction to Matlab)

2015

Hilbertian analysis (Practical, Introduction to Matlab)

2015

Analysis tutorials

1st year IMA (Bachelor level)

Spring Semesters

2014-2016

PDE Discretization Techniques (Practical, Matlab project)

2014-2016

Krylov space methods (Practical, Matlab project)
2nd year IMA (Master level)

2014-2015

Differential calculus (Tutorials)

1st year IMA (Master level)

8 Research education and training

July 2018

TRIPODS Summer School “Fundamentals in Data Analysis”
Wisconsin Institute for Discovery, Madison (WI, USA)

A week of courses and hands-on sessions covering a range of techniques used in modern data science:

- Randomized numerical linear algebra

M. Mahoney (UC Berkeley, USA)

- High-dimensional statistics

P. Loh, A. Zhang (Univ. Wisconsin-Madison, USA)

- Interactive Machine Learning

R. Nowak (Univ. Wisconsin-Madison, USA)

- Graphs and Networks

S. Roch (Univ. Wisconsin-Madison, USA)

- Continuous Optimization

D. Drusvyatskiy, M. Fazel (Univ. Washington, Seattle, USA)

S. Wright (Univ. Wisconsin-Madison, USA)

- Deep Learning

Z. Harchaoui (Univ. Washington, Seattle, USA)

August 2017

Autumn school on Optimization in Machine Learning and Data Science
ALOP Group, Trier Universität, Germany

Three series of lectures with practical sessions:

- Fundamental algorithmic approaches relevant to data analysis

S. Wright (Univ. Wisconsin-Madison, USA)

- Optimization approaches for fitting the canonical tensor decomposition

T. Kolda (Sandia National Labs., USA)

- High performance simplex methods

J. Hall (Univ. Edinburgh, UK)

September 2015

Summer school on machine learning and applications
CIMI, University of Toulouse, France

One week course divided in four units:

- Reinforcement Learning

B. Scherrer/A. Lazaric (INRIA, France)

- Optimization methods for machine learning

P. Richtárik (Univ. Edinburgh, UK)

- Information Retrieval

M. Melucci (Univ. Padua, Italy)

- Dictionary Learning

J. Mairal (INRIA, France)

Two workshops on Optimization for Machine Learning and Sequential Learning.

May 2015	<p>Course on numerical optimization and applications <i>XLIM, University of Limoges, France</i></p> <p>Three short doctoral courses:</p> <ul style="list-style-type: none"> - Bundle methods for nonsmooth optimization <i>D. Noll, (IMT, France)</i> - Complementarity problems and applications <i>M. Haddou (INSA Rennes, France)</i> - Nonsmooth, nonconvex optimization <i>M. Overton (Courant Institute, NY, USA)</i>
December 2014	<p>Introduction to probabilistic constraints <i>Institute of Mathematics of Toulouse, France</i></p> <p>Seminar and short course Lecturer: René Henrion (Weierstrass Institute, Germany)</p>
June 2014	<p>NATCOR Convex Optimization Course <i>The University of Edinburgh, Edinburgh, UK</i></p> <p>PhD Student Course Main lecturers: J. Hall, J. Gondzio, P. Richtárik.</p>
April 2014	<p>Uncertainty Quantification : Theory and Applications to Algorithms, Computational Fluid Dynamics and Geosciences <i>CERFACS, Toulouse, France</i></p> <p>CERFACS training course Lecturers: P. Sagaut, P. Congedo, V. Mallet.</p>
July 2013	<p>PDE-Constrained Optimization Sparse Optimization and Applications to Image Processing <i>Universidade Nova de Lisboa, Lisbon, Portugal</i></p> <p>Summer schools of the conference ICCOPT 2013 Lecturers: S. Wright, M. Figueiredo, C. Meyer, M. Ulbrich.</p>

9 Education

2013-2016	PhD in applied mathematics Topic: <i>Probabilistic properties and complexity analysis in derivative-free optimization</i> Supervisors: Serge Gratton (Univ. Toulouse) and Luis Nunes Vicente (Univ. Coimbra, Portugal) <i>Defended on November 4, 2016.</i> IRIT (Institute for Research in Computer Science of Toulouse) Toulouse, France
2012-2013	Master Degree in Computer Science <i>Minor: Distributed Systems and Critical Software</i> INPT (National Polytechnical Institute of Toulouse) Toulouse, France
2010-2013	Engineer Degree in Computer Science and Applied Mathematics <i>Department: Computer Science and Applied Mathematics (IMA)</i> <i>Minor: Applied Mathematics</i> ENSEEIH (National Engineering School of Electrotechnics, Electronics, Computer Science, Hydraulics and Telecommunications) Toulouse, France

10 Programming skills

Imperative programming	C, Fortran
Object-oriented programming	Java, C++, Python
Functional programming	CamL
Mathematical computations	Matlab, R, Maple, Julia

11 Languages

French	Mother tongue
English	Fluent <i>I lived and worked in the United States (Illinois+Wisconsin) for three years.</i>
Portuguese	Intermediate level, good written understanding <i>I spent three months in Coimbra (Portugal) for an internship.</i>
Spanish	Scholar, basics in understanding and communication