

CLÉMENT W. ROYER

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Postdoctoral research associate in optimization.

CURRENT POSITION AND PAST ACTIVITIES

Wisconsin Institute for Discovery

Postdoctoral research associate

Starting November 14, 2016

Madison, WI, USA

- In the Optimization theme, supervised by Stephen J. Wright.

Institute for Research in Computer Science in Toulouse (IRIT) October 2013-October 2016

Research Assistant

Toulouse, France

- In the Parallel Algorithms and Optimization (APO) Team.

INPT-ENSEEIH Engineering school

Teaching Assistant

October 2013-September 2016

Toulouse, France

- Practical courses: Parallel Programming with OpenMP (in C); Linear Algebra, PDE Discretization Techniques, Krylov Space Methods and Numerical Optimization (using MATLAB).
- Tutorial classes: Differential Calculus, Analysis Tutorials.

Argonne National Laboratory

Visiting scholar - Thesis Parts Appointment

February-April 2016

Lemont, IL, USA

- Supervised by Stefan Wild and Jeffrey Larson at the Mathematics and Computer Science Department.
- Worked on simulation-based optimization problems.

PUBLICATIONS

Authors are always listed by alphabetical order.

Submitted for publication

- C. W. Royer and S. J. Wright. **Complexity analysis of second-order line-search algorithms for smooth nonconvex optimization.** Technical report arXiv:1706.03131, June 2017.
- 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.** Preprint 17-21, Dept. Mathematics, Univ. Coimbra, 2017.
- S. Gratton, C. W. Royer, L. N. Vicente and Z. Zhang. **Direct search based on probabilistic feasible descent for bound and linearly constrained problems.** Preprint 17-10, Dept. Mathematics, Univ. Coimbra, 2017.

Publications in refereed journals

- S. Gratton, C. W. Royer, L. N. Vicente and Z. Zhang. **Complexity and global rates of trust-region methods based on probabilistic models.** To appear in *IMA Journal of Numerical Analysis*, 2017.
- 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.
- 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.

Conference proceedings

- 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.

PhD Thesis

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

EDUCATION

PhD in applied mathematics

2013-2016

Obtained November 4, 2016

UPS, University of Toulouse, France

- Topic: Probabilistic properties and complexity analysis in derivative-free optimization methods.
- Co-advised by Serge Gratton (Univ. Toulouse) and Luís Nunes Vicente (Univ. Coimbra, Portugal).

Engineering and Master's Degree in Computer Science

2010-2013

Two degrees equivalent to Master's degree

INPT, University of Toulouse, France

- Engineering Degree in Computer Science and Applied Mathematics, minor in Scientific Computing.
- Master's Degree in Computer Science, minor in Distributed Computing and Critical Software.

SELECTED PRESENTATION TOPICS

Complexity of Nonconvex Line Search Methods

Accepted talk

- *Optimization 2017*, Lisbon (Portugal), September 2017.
- *MOPTA 2017*, Bethelhem (États-Unis), August 2017.

Probabilistic Properties in Optimization Methods

Invited Seminar

- *SPOC Seminar*, Institut de Mathématiques de Bourgogne, Dijon (France), April 2017.
- *WID-DOW Seminar*, University of Wisconsin-Madison (WI, USA), April 2016.
- *LANS Seminar*, Argonne National Laboratory (IL, USA), April 2016.

Direct Search using Probabilistic (Feasible) Descent

Invited talk

- *SIAM Conference on Optimization*, Vancouver (BC, Canada), May 2017.
- *International Symposium of Mathematical Programming*, Pittsburgh (PA, USA), July 2015.

From First to Second-Order Quality Measures in Direct-Search Methods

Accepted talk

- *Days of the GDR MOA (CNRS activity group)*, Dijon (France), December 2015.
- *13th EUROPT Workshop*, Edinburgh (UK), July 2015.

SKILLS

Main programming experience

Matlab, C, C++, Fortran

Additional programming skills

Java, CamL, Maple

Languages

French (native), English (fluent),

Portuguese (intermediate), Spanish (scholar)