

# Charlie Vanaret

POSTDOCTORAL RESEARCHER IN OPTIMIZATION

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Qualified by the French National Board of Universities (section 27 – computer science) to apply for associate professor positions

## Experience

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### Argonne National Laboratory, Mathematics and Computer Science Division

Lemont, IL, USA

POSTDOCTORAL APPOINTEE

May 2017 - to date

Supervised by Sven Leyffer

- Participate in *Robust nonlinear optimization* project

### IRT Saint Exupéry, Department of Embedded Systems

Toulouse, France

POSTDOCTORAL RESEARCHER

Sept 2015 - March 2017

Supervised by Anne Gazaix (Airbus)

- Participated in *Multidisciplinary Design Optimization* project for aeronautical optimization (TRL 3-5)
- Performed mathematical analysis of distributed resolution strategy, computation of coupled sensitivities, implementation and numerical comparison with other strategies
- Contributed to the design and implementation of an industrial-scale Python program
- Devised and implemented a methodology to assist in the comparison of resolution strategies

### IRIT, Parallel Algorithms and Optimization Team

Toulouse, France

TEACHING AND RESEARCH FELLOW

Nov 2014 – Aug 2015

Supervised by Daniel Ruiz

- Co-supervised an undergraduate student in Python programming
- Participated in *Genomic Breeding decision support* project: correlation of genotypic and phenotypic measures of corn plants
- Suggested models for missing DNA information and validated them on real data provided by two French seed companies

## Awards

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2015 **Léopold Escande prize (15% best PhD theses of the year)**, INPT

Toulouse, France

2015 **Paul Sabatier prize (best research work in mathematics/computer science)**, Académie des Sciences de Toulouse

Toulouse, France

## Education

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### INPT (Toulouse institute of technology) - ENAC (French civil aviation university)

Toulouse, France

PHD IN COMPUTER SCIENCE

2011 - 2014

*Hybridization of evolutionary algorithms and interval-based methods for optimizing difficult problems*, defended on 27 January 2015

Supervised by Nicolas Durand (ENAC)

### ENSEEIH (Graduate school of engineering in computer science)

Toulouse, France

ENGINEERING DIPLOMA IN COMPUTER SCIENCE AND APPLIED MATHEMATICS

2008 - 2011

Differential calculus, linear algebra, operations research, imperative, functional and object-oriented programming

### Alpen-Adria Universität Klagenfurt

Klagenfurt, Austria

ERASMUS SEMESTER

2010 - 2011

Soft computing, intelligent agents, computational intelligence, web technologies

## Skills

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<b>Operating systems</b>	GNU/Linux, Microsoft Windows
<b>Programming</b>	Python, OCaml, C, Java, Matlab, C++
<b>Software</b>	Eclipse, Emacs
<b>Version control</b>	Git, Mercurial, SVN
<b>Typesetting</b>	$\LaTeX$ , OpenOffice, Microsoft Office

## Teaching experience (275 hours)

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### ENSEEIH

Toulouse, France

#### TUTOR

2012 - 2016

Operations research (44 hours), functional programming (156 hours), probability theory and statistics (12 hours) and middleware (22 hours) for first- and second-year engineering students in computer science and applied mathematics

### INPT

Toulouse, France

#### TUTOR

2015

Imperative programming in Python (16 hours) for undergraduate students preparing competitive entrance to engineering schools

### ENAC

Toulouse, France

#### TEACHING ASSISTANT

2013

Project supervisor for first- and second-year engineering students in computer science. Tutor in physics and chemistry for student pilots, taught course in English (25 hours)

## Languages

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<b>English</b>	Fluent. TOEIC score: 990/990 in June 2010
<b>German</b>	Advanced level. 10+ years learning, spent a year in Austria
<b>French</b>	Native speaker

## Leisure activities

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<b>Electric bass</b>	Playing since 2003. Opened for renowned French artists (Soldat Louis, Manau, Michael Jones)
<b>Performing arts</b>	Taking singing lessons since 2015. Put on a musical with a group of ten singers (two performances in Toulouse in 2016)
<b>Table tennis</b>	Playing since 2003. Ranked 4th in school team national championship in 2006. President of the INPT university club in 2009

## Selected publications

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### PHD THESIS

- [1] C. Vanaret. "Hybridation d'algorithmes évolutionnaires et de méthodes d'intervalles pour l'optimisation de problèmes difficiles". PhD thesis. Institut National Polytechnique de Toulouse, 2015.

### BOOK CHAPTERS

- [2] N. Durand, D. Gianazza, J-B. Gotteland, C. Vanaret, and J-M. Alliot. *Métaheuristiques. Application en gestion du trafic aérien*. Ed. by Eyrolles. 2014.

### INTERNATIONAL JOURNALS

- [3] A. Bouchachia, A. Léna, and C. Vanaret. "Online and interactive self-adaptive learning of user profile using incremental evolutionary algorithms". In: *Evolving Systems* (2013).
- [4] A. Bouchachia and C. Vanaret. "GT2FC: An online growing interval type-2 self-learning fuzzy classifier". In: *IEEE Transactions on Fuzzy Systems* (2013).

### INTERNATIONAL CONFERENCES AND WORKSHOPS

- [5] C. Vanaret, J-B. Gotteland, N. Durand, and J-M. Alliot. "Hybridization of Interval CP and Evolutionary Algorithms for Optimizing Difficult Problems". In: *Principles and Practice of Constraint Programming (CP 2015)*. 2015, pp. 446–462.

- [6] C. Vanaret, N. Durand, and J-M. Alliot. “Windmill pattern optimization using evolutionary algorithms”. In: *Genetic and Evolutionary Computation Conference (GECCO 2014)*. 2014.
- [7] C. Vanaret, J-B. Gotteland, N. Durand, and J-M. Alliot. “Preventing premature convergence and proving the optimality in evolutionary algorithms”. In: *Artificial Evolution (EA 2013)*. 2014, pp. 29–40.
- [8] J-M. Alliot, J-B. Gotteland, C. Vanaret, N. Durand, and D. Gianazza. “Implementing an interval computation library for OCaml on x86/amd64 architectures”. In: *17th ACM SIGPLAN International Conference on Functional Programming (ICFP 2012)*. 2012.
- [9] C. Vanaret, D. Gianazza, N. Durand, and J-B. Gotteland. “Benchmarking conflict resolution algorithms”. In: *5th International Conference on Research in Air Transportation (ICRAT 2012)*. 2012.
- [10] A. Bouchachia and C. Vanaret. “Incremental learning based on growing Gaussian mixture models”. In: *10th International Conference on Machine Learning and Applications and Workshops (ICMLA 2011)*. 2011, pp. 47–52.