

# Gwendal Collet

## Curriculum Vitae

Technische Universität  
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I am currently a Postdoctoral researcher at the *Technische Universität* in Vienna (Austria), within the SFB F50-02 project: *Shape Characteristics of Planar Maps and Planar Graphs*, supervised by Michael Drmota.

### Research topics

I am interested in combinatorics and discrete mathematics in various flavours. My main interest is the study of families of combinatorial objects (trees, planar maps, permutations, . . .) and their enumeration: either to get closed formulas, or to study asymptotic properties of large structures. The methods I use mainly come from bijective and analytic combinatorics, as from symbolic method. I also exploit these methods for random sampling and algorithmics over discrete structures. I am also fond of probabilities and want to discover how these objects behave as large random metric spaces.

### Ph.D. in Computer Science

Subject **Bijective Combinatorics of Planar Maps.**

Advisers Gilles Schaeffer and Éric Fusy, LIX, École Polytechnique.

Description A planar map is a graph endowed with an embedding, without edge crossing, on the sphere (considered up to continuous deformation). I have studied several families of maps with constraints over the degree of faces, vertices, in order to give a precise enumeration. By bijective methods, I described the (multivariate) generating series of this maps, giving way to exact and asymptotic counting, but also to obtain more refined information such as the behaviour of graph distance and the induced topology of these maps.

### Education

2008–2010 **M.Sc. Computer Science**, *ENS de Cachan, France*, rank : 23/55.

Master Parisien de Recherche en Informatique

2007–2008 **B.Sc. Computer Science**, *Université Paris 7-Diderot, France*.

2007–2008 **B.Sc. Mathematics**, *Université Paris 7-Diderot, France*.

2007 **Admission to École Normale Supérieure de Cachan, via Computer Science examination.**

### Scientific internships

2010–2011 **École Polytechnique**, *Palaiseau (France)*.

under the supervision of Éric Fusy, "Combinatorics of planar maps"

March–Aug. **University of Warwick**, *Coventry (UK)*, in Game Theory.

2009 under the supervision of Marcin Jurdziński

July–August **Université de Montréal**, *Montréal (Canada)*.

2008 under the supervision of Pierre McKenzie, "Arithmetic circuits over finite fields"

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## Publications

### Journals

2015 *Random maps*, avec Céline Abraham, Jérémie Bettinelli et Igor Kortchemski, ESAIM: Proceedings and Surveys, Volume 51 (p.133–149).

2014 *A simple formula for the series of constellations and quasi-constellations with boundaries*, avec Éric Fusy, in *Electronic Journal of Combinatorics*, Volume 21, Issue 2 (p2.9).

### Conferences with acts

July 2016 *Vertex degrees in planar maps*, with Michael Drmota and Lukas Klausner, AofA'16 (Krakow, Poland).

June 2016 *Random sampling of ordered trees according to the number of occurrences of a pattern*, with Julien David and Alice Jacquot, GASCom'16 (La Marana, France).

June 2014 *On the distance-profile of random plane graphs*, with Olivier Bernardi and Éric Fusy, AofA'14 (Paris, France).

January 2014 *A bijection for plane graphs and its applications*, with Olivier Bernardi and Éric Fusy, ANALCO'14 (Portland, USA).

August 2012 *A simple formula for the series of bipartite and quasi-bipartite maps with boundaries*, with Éric Fusy, FPSAC'12 (Nagoya, Japan).

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## Teachings

Sept.–Nov. 2013 **Tutorials**, *Basis of Programming and Algorithmics (Java)*, 2nd year, École Polytechnique, Palaiseau (France)

2013–2014 **Tutorials**, *Introduction to Computer Science (Java)*, 1st year, École Polytechnique, Palaiseau (France)

Sept.–Feb. 2012 **Tutorials**, *Functional programming (OCaml)*, 3rd year, B.Sc. Computer Science, Université Paris Sud 11, Orsay (France).

March–June 2011 **Tutorials**, *Functions of real variable*, 1st year, B.Sc. Math.-Computer Science, Université Paris-Est-Créteil (France).

March–June 2011 **Tutorials**, *Functions of several variables*, 2nd year, B.Sc. Science for Engineers, Université Paris-Est-Créteil (France).

March–June 2010 **Tutorials**, *Functions of real variable*, 1st year, B.Sc. Physics and Chemistry, Université Paris-Est-Créteil (France).

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## Miscellaneous

2014 Member of organizing committee of AofA'15 (Strobl, Austria).