Vincent Jugé

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Current Position

Université Gustave Eiffel (UGE)   Champs-sur-Marne, France

Assistant Professor (Maître de Conférences)   *since September 2017*
at Laboratoire d'Informatique Gaspard-Monge (LIGM), CNRS & UGE

Education & Previous Positions

CNRS & École Normale Supérieure Paris-Saclay   Cachan, France

Post-Doctoral Researcher   *2016 – 2017*
at Laboratoire Spécification & Vérification (LSV)
with Patricia Bouyer-Decitre and Nicolas Markey

Université Paris-Diderot (now Université de Paris)   Paris, France

PhD in Computer Science   *2012 – 2016*
PhD Thesis defended *with highest honors and congratulations of the jury* on February 5, 2016
at Institut de Recherche en Informatique Fondamentale (IRIF), CNRS & Université Paris-Diderot
- Title: Combinatorics of Braids
- Supervisor: Jean Mairesse
- Referees: Patrick Dehornoy, Jean Goubault-Larrecq and Vadim Kaimanovich
- Committee Members: Patrick Dehornoy, Jean Goubault-Larrecq, Jean Mairesse,
  Dominique Poulalhon, Pascal Weil (chair) and Bertold Wiest

École Nationale Supérieure des Mines de Paris   Paris, France

Engineering Degree (Ingénieur du Corps des Mines)   *2009 – 2012*
Public administration

École Polytechnique   Palaiseau, France

Engineering Degree (Ingénieur de l'École Polytechnique)   *2006 – 2009*
Computer science & mathematics

Lycée Louis Pasteur   Neuilly-sur-Seine, France

Classes Préparatoires aux Grandes Écoles   *2004 – 2006*
Mathematics, physics & computer science

Research Experience Abroad

Eidgenössische Technische Hochschule (ETH)   Zurich, Switzerland

Master Internship in Computer Science   *2010 – 2011*
Chair of Information Security
Supervisors: David Basin and Felix Klaedtke

Rice University   Houston, United States

Bachelor Internship in Computer Science   *2009*
Department of Computer Science
Supervisor: Moshe Vardi

Other Professional Experience

Cryptolog   Paris, France

Software Engineer   *2009 – 2010*
I developed software and designed proofs of concepts for cryptology-related projects

Zodiac – Intertechnique   Plaisir, France

Handcrafting   *August 2008*
I assembled oxygen masks designed for aircraft pilots

Centre d'Analyse de Défense, Délégation Générale pour l'Armement   Arcueil, France

Military Service   *2006 – 2007*
I modelled acoustic phenomena in urban areas

List of Publications

International Journals

Finding automatic sequences with few correlations   *2024*
  Joint work with Irène Marcovici
  RAIRO – Theoretical Informatics and Applications, volume 58, article 10

On shuffled-square-free words   *2023*
  Joint work with Laurent Bulteau and Stéphane Vialette
  in *Theoretical Computer Science*, volume 941, pages 91–103

Asymptotic combinatorics of Artin-Tits monoids and of some other monoids   *2019*
  Joint work with Samy Abbes, Sébastien Gouëzel, and Jean Mairesse
  in *Journal of Algebra*, volume 525, pages 497–561

The relaxation normal form of braids is regular   *2017*
  in *International Journal of Algebra and Computation*, volume 27, issue 04, pages 61–105

Uniform measures on braid monoids and dual braid monoids   *2017*
  Joint work with Samy Abbes, Sébastien Gouëzel, and Jean Mairesse
  in *Journal of Algebra*, volume 473, pages 627–666

Curve diagrams, laminations, and the geometric complexity of braids   *2015*
  in *Journal of Knot Theory and Its Ramifications*, volume 24, issue 08

Enforceable security policies revisited   *2013*
  Joint work with David Basin, Felix Klaedtke, and Eugen Zălinescu
  in *ACM Transactions on Information and System Security*, volume 16, issue 1

International Conferences

Galloping in fast-growth natural merge sorts   *2022*
  Joint work with Elahe Ghasemi and Ghazal Khalighinejad
  International Colloquium on Automata, Languages and Programming (ICALP), LIPIcs volume 229, pages 68:1–68:19

Reduction ratio of the IS-algorithm: Worst and random cases   *2022*
  Combinatorial Pattern Matching (CPM), LIPIcs volume 223, pages 8:1–8:23

Permutation pattern matching for doubly partially ordered patterns   *2022*
  Joint work with Laurent Bulteau, Guillaume Fertin et Stéphane Vialette
  Combinatorial Pattern Matching (CPM), LIPIcs volume 223, pages 21:1–21:17

Finding automatic sequences with few correlations   *2022*
  Joint work with Irène Marcovici
  Random generation of combinatorial structures (GASCom), PuMA volume 30, issue 1, pages 75–81

Uniform generation of infinite concurrent runs: the case of trace monoids   *2022*
  Joint work with Samy Abbes
  Random generation of combinatorial structures (GASCom), PuMA volume 30, issue 1, pages 1–7

Adaptive Shivers sort: an alternative sorting algorithm   *2020*
  Symposium on Discrete Algorithms (SODA), ACM-SIAM symposium, pages 1639–1654

Timed systems through the lens of logic   *2019*
  Joint work with Sundararaman Akshay, Paul Gastin and Shankara Narayanan Krishna
  Logic in Computer Science (LICS), 34th annual ACM/IEEE symposium, pages 359–371

Finite bisimulations for dynamical systems with overlapping trajectories   *2018*
  Joint work with Béatrice Bérard and Patricia Bouyer-Decitre
  Computer Science Logic (CSL), LIPIcs volume 118, pages 26:1–26:17

On the worst-case complexity of TimSort   *2018*
  Joint work with Nicolas Auger, Cyril Nicaud, and Carine Pivoteau
  European Symposium on Algorithms (ESA), LIPIcs volume 112, pages 4:1–4:13

Unbounded product-form Petri nets   *2017*
  Joint work with Patricia Bouyer-Decitre and Serge Haddad
  in *Concurrency Theory* (CONCUR), LIPIcs volume 85, pages 31:1–31:16

Dynamic complexity of the Dyck reachability   *2017*
  Joint work with Patricia Bouyer-Decitre
  in *Foundations of Software Science and Computation Structures* (FoSSaCS), LNCS volume 10203, pages 265–282

Enforceable security policies revisited   *2012*
  Joint work with David Basin, Felix Klaedtke, and Eugen Zălinescu
  in *Principles of Security and Trust* (POST), LNCS volume 7215, pages 309–328

Preprints

Counting A'Campo bi-colored forests *2017*
Joint work with Noémie Combe
available on [arXiv]

Courcelle's theorem made dynamic *2017*
Joint work with Patricia Bouyer-Decitre and Nicolas Markey
available on [arXiv]

Abelian Ramsey length and asymptotic lower bounds *2016*
available on [arXiv]

Dynamic complexity of parity games with bounded tree-width *2016*
Joint work with Patricia Bouyer-Decitre and Nicolas Markey
available on [arXiv]

PhD Manuscript

Combinatorics of braids *2016*
available on [my web page]

Bachelor Thesis

Complexity of Decision Problems in Computational Logic *2009*
available on [my web page]

Teaching and Mentoring

Teaching

Université Paris Cité *since 2020*
I teach and have taught the following class, for a total of 36 hours:
- *Algorithm analysis* (5th-hear course), lectures

Université Paris-Est Marne-la-Vallée *since 2017*
I teach and have taught the following classes, for a total of 1300 hours:
- *Web programming* (1st-year course), lectures and computer lab sessions
- *Algorihmics and trees* (2nd-year course), computer lab and exercise sessions
- *Java programming* (3rd-year and 4th-year courses), computer lab sessions
- *Networks* (3rd-year course), computer lab and exercise sessions
- *Mathematics* (3rd-year course), lectures and exercise sessions
- *Complexity of algorithms* (4th-year course), exercise sessions
- *Algorithms and probabilities* (5th-year course), lectures and exercise sessions

École Polytechnique *2023*
Examiner in *computer science* for the entrance examination

Écoles Normales Supérieures of Lyon, Paris-Saclay and Rennes *2018 – 2021*
Examiner in *theoretical computer science* for the entrance examination

École Polytechnique *2017*
I taught the following classes during my post-doc, for a total of 64 hours:
- *Web development* (4st-year course), computer lab sessions
- *Big data analytics* (4st-year course), computer lab sessions

Université Paris-Diderot (now Université Paris Cité) *2012 – 2015*
I taught the following classes during my PhD, for a total of 188 hours:
- *Discovering Binary Machines* (1st-year course), lectures and exercise sessions
- *Concepts in Computer Science* (1st-year course), exercise sessions
- *Type and Data* (1st-year course), computer lab sessions
- *Programming Project* (2nd-year course), computer lab sessions
- *Finite Automata* (2nd-year course), computer lab sessions
- *Object-Oriented Programming* (2nd-year course), computer lab and exercise sessions

Lycée Louis Pasteur *2014 – 2016*
I supervised oral exercise sessions in mathematics for 1st-year students, for a total of 120 hours

Lycée Raspail *2012 – 2014*
I supervised oral exercise sessions in mathematics for 2nd-year students, for a total of 100 hours

ETH Zurich *2011*
I supervised exercise sessions for the class *Information Security* (3rd-year course), for a total of 30 hours

Student supervision

PhD students

- June Roupin (PhD student at UGE, also supervised by Éric Fusy)   *2022 – 2025*

Bachelor & master students

- Sina Ghasminejad (4th-year student at Sharif University, Tehran, Iran)   *2023 – 2024*
- Hugo Demaret (3rd-year student at Université Paris Cité)   *2023*
- Julien Roupin (5th-year student at École Polytechnique)   *2022*
- Helia Yazdanyar (4th-year student at Sharif University, Tehran, Iran)   *2022 – 2023*
- Elahe Ghasemi (4th-year student at Sharif University, Tehran, Iran)   *2021 – 2022*
- Ghazal Khalighinejad (3rd-year student at Sharif University, Tehran, Iran)   *2020*
- Christophe Callé (3rd-year student at UGE)   *2018*

Extracurricular Tutoring

Member of the Préparation Olympique Française de Mathématiques (POFM)   *since 2012*

The POFM aims at developing extracurricular mathematics, including olympiad-style mathematics, among secondary school and high school students. As a member of the POFM, I have taught classes at two dozens mathematical camps and I have been one of the coaches of the French team for International Mathematical Olympiads

Team leader or deputy leader of the French team at several mathematical olympiads:

- International Mathematical Olympiads (IMO) from 2014 to 2017, then since 2019
- Romanian Master of Mathematics (RMM) since 2019
- Junior Balkan Mathematical Olympiads (JBMO) 2013, 2014 and 2015

Team leader of several other teams at mathematical competitions:

- Team *France 2* at the International Tournament for Young Mathematicians (ITYM) 2013.
  The ITYM is open to teams of high school students, who are given several months to try solving open mathematical problems under the supervision of their team leader
- Team *Orsay 2* at the Tournoi Français des Jeunes Mathématiciennes et Mathématiciens (TFJM^2) 2013.
  The TFJM^2 is the French version of the ITYM
- Teams of École Polytechnique, ETH Zurich and ENS Paris at the International Mathematics Competition for University Students (IMC) from 2010 to 2013

Member of the jury of several mathematical and programming competitions:

- Concours général de mathématiques since 2019
- South-Western Europe Regional Contest (SWERC) 2018, 2019, 2020 and 2023
- French-Chinese competition *Compter avec l'autre* 2017, 2019 and 2021
- TFJM^2 since 2012
- ITYM 2012, 2013, 2014 and 2018
- IMC from 2010 to 2013

Teacher that the mathematical club Parimaths   *2012 – 2017*

The mathematical club *Parimaths* organises weekly sessions for secondary school and high school students, where they can discover mathematics that differ from those they would usually see at school. I have taught classes at a dozen sessions of the club

Honors and Awards

Prix du stage de recherche de l'École Polytechnique   *2009*
I was awarded this prize for my bachelor thesis

International Mathematics Competition for University Students   *2008 & 2009*
First prize both years

International Mathematical Olympiad   *2004*
Honorable mention

French Mathematical Olympiad   *2003*
Ranked 4th

Language Skills

French	• Mother language	
English	• Professional proficiency	• TOEFL iBT: 110/120
German	• Professional proficiency	• Goethe-Institut ZMP (C1 level)