

# Vincent PENELLE

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## Current Position

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Maître de conférence (associate professor) in LaBRI (University of Bordeaux), Méthodes Formelles team. I am a member of the ANR projects BraVAS and Delta.

I am mainly interested in automata theory, language theory, formal verification and infinite graph theory. Previously, I worked on the origin semantic of streaming transducers the decidability of logics over words (variants of MSO and FO), stack tree rewriting systems and trace languages of vector addition systems, problems on which I am still interested.

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## Previous positions

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**2016–2017** : **Post-doc** in the computer science institute of the University of Warsaw, in the project «A unified theory of finite state recognisability», lead by Mikołaj Bojanczyk.

**February–June 2016** : **Research visit** with Matthew Hague, Royal Holloway, University of London

**2015–2016** : **demi-ATER** in the Algorithmique team. LIGM, UPEM

**2012–2015** : **Allocataire moniteur** in the Algorithmique team. LIGM, UPEM

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## Education

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**2012–2015** : **PhD** supervised by Didier Caucal and Antoine Meyer. LIGM, UPEM

**2011–2012** : **Research internship** supervised by Didier Caucal and Antoine Meyer. LIGM, UPEM.

**2010–2011** : **2<sup>nd</sup> year of Master Parisien de Recherche en Informatique (MPRI)** (mention bien). ENS Cachan (normalien).

**2009–2010** : **1<sup>st</sup> year of Master Parisien de Recherche en Informatique (MPRI)** (mention très bien). ENS Cachan (normalien).

**2008–2009** : **Licence of mathematics** of ENS Cachan (mention bien) and **licence of computer sciences** of ENS Cachan (mention très bien). Normalien.

**2006–2008** : **Classe préparatoires, MPSI - MP\*** in Lycée Michel Montaigne (Bordeaux). Admitted at the ENS Cachan concourse.

**2006** : **Baccalauréat scientifique**, speciality mathematics (mention très bien) in Lycée de l'Image et du son (Angoulême).

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## Information about PhD

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**Title** : Rewriting Higher-order Stack Trees and Traces of Counter Systems  
**Advisors** : Didier Caucal and Antoine Meyer  
**Laboratory** : LIGM, Université Paris-Est, Marne-la-vallée  
**Defence** : 20 novembre 2015  
**Mention** : UPEM does not give any mention  
**Jury** : Marie-Pierre Béal, Didier Caucal,  
Thomas Colcombet, Jérôme Leroux,  
Christof Loeding (Rewiewer), Antoine Meyer  
Géraud Sénizergues (Rewiewer).

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## Publications

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### In a journal with reviewer comity

- [1] Vincent Penelle. Rewriting higher-order stack trees. *Theory Comput. Syst.*, 61(2) :536–580, 2017.

### In an international conference with reviewer comity

- [2] Mikołaj Bojańczyk, Laure Daviaud, Bruno Guillon, and Vincent Penelle. Which classes of origin graphs are generated by transducers. In *44th International Colloquium on Automata, Languages, and Programming, ICALP 2017, July 10-14, 2017, Warsaw, Poland*, pages 114 :1–114 :13, 2017.
- [3] Sougata Bose, Anca Muscholl, Vincent Penelle, and Gabriele Puppis. Origin-equivalence of two-way word transducers is in PSPACE. In *38th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science, FSTTCS 2018, December 11-13, 2018, Ahmedabad, India*, pages 22 :1–22 :18, 2018.
- [4] Sougata Bose, Krishna Shankara Narayanan, Anca Muscholl, Vincent Penelle, and Gabriele Puppis. On synthesis of resynchronizers for transducers. In *44th International Symposium on Mathematical Foundations of Computer Science, MFCS 2019, August 26-30, 2019, Aachen, Germany*, page To Appear, 2019.
- [5] Matthew Hague and Vincent Penelle. Constrained dynamic tree networks. In *Reachability Problems - 12th International Conference, RP 2018, Marseille, France, September 24-26, 2018, Proceedings*, pages 45–58, 2018.
- [6] Jérôme Leroux, Vincent Penelle, and Grégoire Sutre. On the context-freeness problem for vector addition systems. In *LICS*, pages 43–52. IEEE Computer Society, 2013.
- [7] Jérôme Leroux, Vincent Penelle, and Grégoire Sutre. The context-freeness problem is conp-complete for flat counter systems. In Franck Cassez and Jean-François Raskin, editors, *ATVA*, volume 8837 of *Lecture Notes in Computer Science*, pages 248–263. Springer, 2014.
- [8] Vincent Penelle. Rewriting higher-order stack trees. In Lev D. Beklemishev and Daniil V. Musatov, editors, *CSR*, volume 9139 of *Lecture Notes in Computer Science*, pages 364–397. Springer, 2015. Best Student Paper Award.
- [9] Vincent Penelle, Sylvain Salvati, and Grégoire Sutre. On the boundedness problem for higher-order pushdown vector addition systems. In *38th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science, FSTTCS 2018, December 11-13, 2018, Ahmedabad, India*, pages 44 :1–44 :20, 2018.
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## Presentations

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- **On the Boundedness Problem for Higher-Order Pushdown Vector Addition Systems** : Séminaire du Labri (01/2019), FSTTCS (12-18).
- **Which Classes of origin graphs are generated by transducers** : Séminaire du LaBRI (10/2017).

- **Rewriting Higher-Order Stack Trees** :Séminaire du LaBRI (11/2017), Université de Varsovie (10/2016), Seminar Oxford University (05/2016), Séminaire INRIA Lille (01/2016), Séminaire LIF (Marseille 01/2016), CSR 2015 (Listvyanka, Russie, 07/2015), Journées GT-SDA2 2015 (LIGM, 04/2015), Journées GT-Alga 2015 (Paris 7, 03/2015), Séminaire IRISA Rennes (01/2015), Séminaire LIGM (01/2015), Séminaire LITIS Rouen (11/2014), Séminaire Liafa Paris (11/2015).
- **The Context-freeness Problem Is coNP-Complete for Flat Counter Systems** : ATVA 2014 (Sydney, Australie, 11/2014)
- **On the Conext-freeness of Vector Addition Systems** : Séminaire VERIMAG (04/2017), Séminaire LIGM (10/2013), LICS 2013 (Nouvelle-Orléans, USA, 07/2013) Séminaire LaBRI, Bordeaux (06/2013).

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## Other research activities

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- Organiser of Autobóz 2018 with Nathanaël Fijalkow and Filip Mazowiecki.
- Reviewer for conferences DLT 2013, CIAA 2014, DLT 2015, ICALP 2016, LICS 2017, LICS 2018, CONCUR 2018, ICALP 2018, MFCS 2019, ICALP 2019, ICTAC 2019, ICLA 2019, LATA 2019 and the JM 2014.
- Reviewer for journal Fundamenta Informatica (2017, 2019).
- September 2014 : Help to organisation of conference Highlights 2014 in Paris.
- February 2013 : Attending winter school Games 2013, in Champéry, Switzerland.
- Summer 2011 : Research internship in Laboratoire Bordelais de Recherche en Informatique in Bordeaux. Subject : "On the context-freeness problem for traces of vector addition systems". Supervisors : Jérôme Leroux and Grégoire Sutre.
- Summer 2010 : Research internship in Universitat Politècnica de Catalunya in Barcelona. Subject : "Converting a pseudo-boolean constraint into a SAT formula via binary decision diagram". Supervisor : Robert Nieuwenhuis.
- Summer 2009 : Research internship in the University of Edinburgh in the Edinburgh Center for Bioinformatics. Subject : "Filling gaps in the human metabolic network with computational method". Supervisor : Igor Goryanin.

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## Teaching since 2017 (university of Bordeaux)

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- Cours Conception Formelle, M1 (42h) : 18-19,
- Cours Vérification des logiciels, M2 (20h) : 18-19,
- TD machine Programmation orientée objet, L3 : 17-18 (64h), 18-19 (32h),
- TD Complexité et Calculabilité, M1 (22h) : 17-18,18-19,
- TD Projet de programmation, M1 : 17-18 (30h), 18-19 (20h),
- Enseignant référent de stages, M2 (12h) : 17-18.

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## Teaching before 2017 (364h)

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- TP Initiation aux systèmes informatiques, L1 (24h),
- CM/TD/TP Algorithmique et programmation (java), DUT1 (48h),
- TP Programmation C, L2 (24h),
- CM/TD/TP Architecture des ordinateurs, L3 (48h),
- CM/TD Architecture des ordinateurs, ESIPÉ 1ère année (18h), *Responsable du cours*
- TP Algorithmique et programmation 1 (C), L1 (48h),
- TD Mathématiques discrètes, DUT 1 (58h),
- TP Algorithmique 4, L3 (18h),
- TD Mathématiques pour l'informatique, L1 (48h)
- TP Verification assistée par ordinateur, master, université de Varsovie (30h)