

Marc Heinrich

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RESEARCH INTEREST

Algorithms on graphs, Complexity, Reconfiguration problems, Counting and Sampling, Combinatorial games.

EDUCATION

- 2019-now Post-doc at the University of Leeds.
- 2016-2019 PhD student at LIRIS, Université Lyon 1, under the supervision of Eric Duchêne and Sylvain Gravier and co-supervised by Nicolas Bousquet.
- 2015-2016 Complex system master at ENS of Lyon
- 2014-2015 MPRI Master program
- 2012-2016 Student at the ENS of Paris in Computer Science
- 2010-2012 Two-years intensive course preparing for the competitive entrance examination to French "Grandes Écoles" in Lycée Saint Louis, Paris
- 2010 Baccalauréat (=graduation from high school)

PUBLICATIONS

- *A polynomial version of Cereceda's conjecture*, Nicolas Bousquet, Marc Heinrich (preprint).
- *The Perfect Matching Reconfiguration Problem*, Marthe Bonamy, Nicolas Bousquet, Marc Heinrich, Takehiro Ito, Yusuke Kobayashi, Arnaud Mary, Moritz Muehlenthaler, Kunihiko Wasa (preprint).
- *Enumerating minimal dominating sets in triangle-free graphs*, Marthe Bonamy, Oscar Defrain, Marc Heinrich, Jean-Florent Raymond, 36th International Symposium on Theoretical Aspects of Computer Science (STACS), 2019.
- *The Glauber dynamics for edges colourings of trees*, Michelle Delcourt, Marc Heinrich, Guillem Perarnau, (preprint).
- *Online graph coloring with bichromatic exchange*, Sylvain Gravier, Marc Heinrich (submitted to Journal of Graph Theory).
- *A generalization of Arc-Kayles*, Antoine Dailly, Valentin Gledel, Marc Heinrich, International Journal of Game Theory, 2018.
- *The switch operators and push-the-button games: a sequential compound over rulesets*, Éric Duchêne, Marc Heinrich, Urban Larsson, Aline Parreau, Theoretical Computer Science, 2018.
- *Computing maximum cliques in B_2 -EPG graphs*, Nicolas Bousquet, Marc Heinrich, 43rd International Workshop on Graph-Theoretic Concepts in Computer Science (WG), 2017.
- *Local conflict coloring*, Pierre Fraigniaud, Marc Heinrich, Adrian Kosowski. IEEE 57th Annual Symposium on Foundations of Computer Science (FOCS), 2016.

TALKS

INTERNATIONAL CONFERENCES

- MFCS, 2019, *The perfect matching reconfiguration problem*.
- Combinatorial Reconfiguration Workshop (CoRe), 2019, *A polynomial version of Cereceda's conjecture*.
- CGTC III (Combinatorial Game Theory Colloquium), Lisbon, 2017, *Partizan Subtraction Games*.
- ICGT (International Conference of Graph Theory), 2018, Lyon, *Online graph coloring with bichromatic exchange*.
- WG 2017, Eindhoven, Netherlands, *Computing maximum cliques in B_2 -EPG graphs*.
- CGTC II, Lisbon, 2017, *Quotients for Push-button Games*.

- FOCS 2016, New Brunswick (USA), *Local Conflict Coloring*.

NATIONAL CONFERENCES/ SEMINARS

- Seminar Alcoloco in Clermont-Ferrand, *Colouring Reconfiguration*.
- JGA 2019, (Journées Graphes et Algorithmes), Bruxelles, November 2019, *The perfect matching reconfiguration problem*.
- CoRe 2019 (Combinatorial Reconfiguration Workshop), July 2019, *A polynomial version of Cereceda's conjecture*.
- JGA 2018, (Journées Graphes et Algorithmes), Grenoble, November 2018, *Dynamique de Glauber pour la coloration d'arête dans les arbres*.
- Seminar in Birmingham, May 2018, *Online graph coloring with bichromatic exchange*.
- Seminar in Warsaw, March 2018, *Online graph coloring with bichromatic exchange*.
- JGA 2017, Bordeaux, November, 2017, *Computing maximum cliques in B_2 -EPG graphs*.
- Seminar 'Journées Combinatoires Rhône-Alpes-Auvergne', September 2017, *Local conflict coloring*.
- JGA 2016, Paris, November 2016, *Changing the rules in combinatorial games*.
- Seminar Graph@Lyon, September 2016, *Local conflict coloring*.

WORK EXPERIENCE

RESEARCH STAYS

- October 2018: two weeks in Tokyo and Sendai in Japan as part of the DATCoRe project. Topic: coloring reconfiguration problems.
- August 2018: one week in Bordeaux. Topic: enumeration and reconfiguration problems.
- March 2018: one week in Warsaw visiting Lucas Pastor. Topic: EPG graphs.
- May-June 2018, two month in Birmingham visiting Guillem Perarnau. Topic: sampling graph colouring using Markov chains.

PROJECTS

I am also a member of the following projects:

- ANR GAG, 'Graphs and Games'.
- DATCoRe, 'Development of Algorithmic Techniques for Combinatorial Reconfiguration' a French-Japanese project.
- ANR GrR, 'Graph Reconfiguration'.

END-OF-DEGREE INTERNSHIPS

- March-July 2016: LIRIS (Laboratoire d'Informatique en Images et Systèmes d'Information) in team GOAL with Eric Duchêne. Topic: ruleset composition operators in combinatorial games.
- March-July 2015: LIAFA (Laboratoire d'Informatique Algorithmique: Fondements et Applications) with Adrian Kosowski and Pierre Fraignaud. Topic: local algorithms, colouring problems.
- March-August 2014 at University TU Dortmund, with Alexander Munteanu and Christian Sohler. Topic: streaming algorithms.
- June to July 2013: LaBRI (Laboratoire Bordelais de Recherche en Informatique) with Bruno Pinaud. Topic: programming of subgraph isomorphism algorithms for a graph rewriting software (Porgy)

TEACHING

- Teaching assistant for the courses:
 - 'Algorithms and Object Oriented Programming' in Java,
 - 'Architecture and Systems',
 - 'Databases and Web Programming',
 - 'Algorithms, Programming and Complexity'.
- Outreach activities in elementary schools (Maths à modeler and Maths en Jeans).

OTHER

Programming languages: Ocaml, C/C++, Java, Scala, Python.

Computer science skills: Linux, L^AT_EX, git.

Languages: French (native), English (fluent).