Antoine Mottet

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Research Profile

I am interested in the study of the complexity of computational problems by using tools from fields of mathematics such as abstract algebra, model theory, or Ramsey theory. The core aspect of my research consists in the study of constraint satisfaction problems with infinite constraint languages, and in particular with ω-categorical constraint languages.

Experience

Since March 2022	**Junior Professor** Research group for Theoretical Computer Science Technische Universität Hamburg
September 2018 – February 2022	**Postdoctoral researcher** Department of Algebra Charles University in Prague

Education

September 2015 – August 2018	**Doctoral studies** Institut für Algebra, Technische Universität Dresden Thesis: *Dichotomies in Constraint Satisfaction: Canonical Functions and Numeric CSPs.* Obtained with distinction *summa cum laude.*
September 2013 – August 2014	**Master 2** in the field of Computer Science *Master Parisien de Recherche en Informatique (MPRI)* École Normale Supérieure de Cachan
September 2012 – August 2013	**Master 1** in the field of Computer Science École Normale Supérieure de Lyon
September 2011 – August 2012	**Bachelor** in the field of Computer Science École Normale Supérieure de Lyon

Scholarships and Awards

2020	**Bernard Bolzano Annual Prize in Mathematics** Awarded by the Bernard Bolzano Endowment Fund for the paper "ω-categorical structures avoiding height 1 identities".
2019	**Ackermann Award**

Outstanding dissertation award of the European Association for Computer Science Logic.

2013-2015 | **Scholarship**
Awarded by the *École Normale Supérieure de Cachan* after a national competitive examination.

PUBLICATIONS IN PEER-REVIEWED JOURNALS

[1] Pierre Gillibert, Julius Jonušas, Michael Kompatscher, Antoine Mottet, and Michael Pinsker. "When Symmetries are not Enough: a Hierarchy of Hard Constraint Satisfaction Problems". In: *SIAM Journal on Computing* (2022).

[2] Manuel Bodirsky, Florent Madelaine, and Antoine Mottet. "A proof of the algebraic tractability conjecture for Monotone Monadic SNP". In: *SIAM Journal on Computing* (2021).

[3] Manuel Bodirsky, Antoine Mottet, Mirek Olšák, Jakub Opršal, Michael Pinsker, and Ross Willard. "ω-categorical structures avoiding height 1 identities". In: *Transactions of the American Mathematical Society* (2021).

[4] Antoine Mottet and Michael Pinsker. "Cores over Ramsey Structures". In: *Journal of Symbolic Logic* (2021).

[5] Franz Baader, Pavlos Marantidis, Antoine Mottet, and Alexander Okhotin. "Extensions of Unification modulo ACUI". In: *Mathematical Structures in Computer Science* (2020). DOI: `https://doi.org/10.1017/S0960129519000185`.

[6] Antoine Mottet and Karin Quaas. "The Containment Problem for Unambiguous Register Automata and Unambiguous Timed Automata". In: *Theory of Computing Systems* (2020).

[7] Manuel Bodirsky, Barnaby Martin, and Antoine Mottet. "Discrete Temporal Constraint Satisfaction Problems". In: *Journal of the ACM* 65 (2018). DOI: `http://dx.doi.org/10.1145/3154832`.

[8] Manuel Bodirsky and Antoine Mottet. "A Dichotomy for First-Order Reducts of Unary Structures". In: *Logical Methods in Computer Science* Volume 14, Issue 2 (2018). DOI: `http://dx.doi.org/10.23638/LMCS-14(2:13)2018`.

[9] Manuel Bodirsky, Victor Dalmau, Barnaby Martin, Antoine Mottet, and Michael Pinsker. "Distance Constraint Satisfaction Problems". In: *Information and Computation* 247 (2016). DOI: `http://dx.doi.org/10.1016/j.ic.2015.11.010`.

PUBLICATIONS IN CONFERENCE PROCEEDINGS

[10] Antoine Mottet and Michael Pinsker. "Smooth Approximations and CSPs over Finitely Bounded Homogeneous Structures". In: *Proceedings of LICS'22*. 2022.

[11] Libor Barto, William DeMeo, and Antoine Mottet. "CSPs over Finite Structures". In: *Proceedings of LICS'21*. 2021.

[12] Wojciech Czerwinski, Antoine Mottet, and Karin Quaas. "New Techniques for Universality in Unambiguous Register Automata". In: *Proceedings of ICALP'21*. 2021.

[13] Antoine Mottet, Tomás Nagy, Michael Pinsker, and Michał Wrona. "Smooth Approximations and Relational Width Collapses". In: *Proceedings of ICALP'21*. 2021.

[14] Pierre Gillibert, Julius Jonušas, Michael Kompatscher, Antoine Mottet, and Michael Pinsker. "Hrushovski's encoding and ω-categorical CSP monsters". In: *Proceedings of ICALP'20*. 2020.

[15] Manuel Bodirsky, Antoine Mottet, Miroslav Olsák, Jakub Oprsal, Michael Pinsker, and Ross Willard. "Topology is relevant (in a dichotomy conjecture for infinite-domain constraint satisfaction problems)". In: *Proceedings of LICS'19*. 2019. DOI: `10.1109/LICS.2019.8785883`.

[16] Antoine Mottet and Karin Quaas. "The Containment Problem for Unambiguous Register Automata". In: *Proceedings of STACS'19*. 2019. DOI: `10.4230/LIPIcs.STACS.2019.53`.

[17] Manuel Bodirsky, Peter Jonsson, Barnaby Martin, and Antoine Mottet. "Classification Transfer for Qualitative Reasoning Problems". In: *Proceedings of IJCAI'18*. 2018. DOI: http://dx.doi.org/10.24963/ijcai.2018/175.

[18] Manuel Bodirsky, Florent Madelaine, and Antoine Mottet. "A universal-algebraic proof of the dichotomy for Monotone Monadic SNP". In: *Proceedings of LICS'18*. 2018. DOI: http://dx.doi.org/10.1145/3209108.3209156.

[19] Manuel Bodirsky, Marcello Mamino, Barnaby Martin, and Antoine Mottet. "The complexity of disjunctive linear Diophantine constraints". In: *Proceedings of MFCS'18*. 2018.

[20] Manuel Bodirsky and Antoine Mottet. "Reducts of finitely bounded homogeneous structures, and lifting tractability from finite-domain constraint satisfaction". In: *Proceedings of LICS'16*. 2016. DOI: http://dx.doi.org/10.1145/2933575.2934515.

[21] Manuel Bodirsky, Barnaby Martin, and Antoine Mottet. "Constraint Satisfaction Problems over the Integers with Successor". In: *Proceedings of ICALP'15*. 2015. DOI: 10.1007/978-3-662-47672-7_21.

Invited Talks

15/01/2020	**Ackermann Award Ceremony** Invited to give a talk presenting my doctoral work upon receiving the Ackermann award.
March 2019	**QuantLA Spring School** Invited to give an intensive course about constraint satisfaction to the graduate students of the DFG Research Training Group *QuantLA*.
16/09/2018	**Colloquium Logicum** Invited to present my doctoral research at the annual meeting of the *Deutsche Vereinigung für Mathematische Logic und Grundlagenforschung in den exakten Wissenschaften*.

Other Scientific Activities

- Conference organization: CSL 2021 (Program Committee), CSP World Congress 2020 (Organizing Committee), CSP World Congress 2021 (Organizing Committee), CSP World Congress 2022 (Organizing Committee)

- Member of the European Association for Computer Science Logic (EACSL) and the European Association for Theoretical Computer Science (EATCS)

- I have reviewed papers for the following journal and conferences: Journal of the ACM, SIAM Journal on Computing, Logical Methods in Computer Science, Discrete Mathematics in Theoretical Computer Science, STOC (2021), SODA (2022), LICS (2019, 2020, 2021, 2022), ICALP (2019, 2020, 2021), STACS (2018, 2019, 2020, 2021), MFCS (2017), ICDT (2015), CSL (2016), FSTTCS (2016, 2019), CiE (2018), GandALF (2022).