Martin Zimmermann
Curriculum Vitae

Contact

Aalborg University
Department of Computer Science
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Positions

since 08/2021	**Associate Professor** at Aalborg University
10/2018 - 07/2021	**Lecturer** at University of Liverpool
05/2013 - 09/2018	**Postdoc** at Saarland University
02/2012 - 04/2013	**Postdoc** at University of Warsaw
02/2009 - 01/2012	**Research Assistant** at RWTH Aachen University

Education

since 09/2021	**Fellow** of the Higher Education Academy UK
12/2015 - 07/2018	**Habilitation** in Computer Science at Saarland University
02/2009 - 01/2012	**PhD** in Computer Science at RWTH Aachen University
09/2003 - 01/2009	**Diploma** in Computer Science at RWTH Aachen University

Awards and Scholarships

2021	**Best Paper Award** at MFCS 2021 for the paper "A Bit of Nondeterminism Makes Pushdown Automata Expressive and Succinct"
2010	**Springorum Medal 2010** for diploma with distinction at RWTH Aachen University
09/2007 - 06/2008	**Fulbright Scholarship** for attending DePaul University, Chicago, USA

Grants

06/2019 - 07/2021	**Co-Investigator** EPSRC Project "Ontology-Based Management of Many-Dimensional Quantitative Data"
01/2015 - 09/2018	**Principal Investigator** DFG Project "Tradeoffs in Controller Synthesis"
09/2018	Financial support from the DFG to organize the "Ninth International Symposium on Games, Automata, Logics, and Formal Verification" (GandALF 2018) in Saarbrücken

Activities

2024	**LAMAS&SR 2024** PC member
2024	**GandALF 2024** PC member
03/2024	**Dagstuhl Seminar "Logics for Dependence and Independence: Expressivity and Complexity"**
since 2023	Summer school **MOVEP** Steering committee member
09/2023	**Dagstuhl Seminar "The Futures of Reactive Synthesis"**
09/2023	Summer School **Reactive synthesis: Main Achievements and current trends** Invited Lecturer
2023	**CSL 2024** PC member
2023	**EUMAS 2023** PC member
2023	**GandALF 2023** PC member
2023	**CONCUR 2023** PC member
2023	**MFCS 2023** PC member

2022	**OVERLAY 2022** PC member
10/2022	**Bertinoro Workshop "Network Verification and Automation Seminar"** Invited Participant
2022	**CSL 2023** PC member
2022	Summer school **MOVEP 2022** PC chair and organizer
09/2021	**Workshop "Automata Theory and Applications: Games, Learning and Structures"** Invited Participant
since 2021	**GandALF** Steering committee member
2020	**GandALF 2020** PC member
2019	**GandALF 2019** PC member
2018	**GandALF 2018** PC co-chair and organizing chair
2018	**Highlights of Logic, Games, and Automata 2018** PC member
2017	**TIME 2017** PC member
12/2016	**Workshop "Algorithmic Verification of Real-time Systems"** Invited Speaker
02/2015	**Workshop "Automata, Concurrency and Timed Systems"** Invited Speaker
02/2015	**Dagstuhl Seminar "Non-Zero-Sum-Games and Control"** Invited Participant

Publications

All papers are available on my homepage.

Under Submission

Sarah Winter and Martin Zimmermann: **Tracy, Traces, and Transducers: Computable Counterexamples and Explanations for HyperLTL Model-Checking**. arXiv:2404.18280

Martin Fränzle, Thomas M. Grosen, Kim G. Larsen, and Martin Zimmermann **Monitoring Real-Time Systems under Parametric Delay**. arXiv:2404.18282

Martin Fränzle, Paul Kröger, Sarah Winter, and Martin Zimmermann: **On the Existence of Reactive Strategies Resilient to Delay**. arXiv:2305.19985

Hadar Frenkel and Martin Zimmermann: **The Complexity of Second-order HyperLTL**. arXiv:2311.15675

Martin Zimmermann: **Robust Probabilistic Temporal Logics**. arXiv:2306.05806

Marie Fortin, Louwe B. Kuijer, Patrick Totzke, and Martin Zimmermann: **HyperLTL Satisfiability is Highly Undecidable, HyperCTL* is Even Harder**. arXiv:2303.16699

Journal Papers

Satya Prakash Nayak, Daniel Neider, Rajarshi Roy, and Martin Zimmermann: **Robust Computation Tree Logic**. Accepted to the special issue of the *Innovations in Systems and Software Engineering* dedicated to NFM 2022. (arXiv:2201.07116)

Shibashis Guha, Ismaël Jecker, Karoliina Lehtinen, and Martin Zimmermann: **A Bit of Nondeterminism Makes Pushdown Automata Expressive and Succinct**. *Logical Methods in Computer Science*, 20(1), 2024

Sean Kauffman and Martin Zimmermann: **The Complexity of nfer**. *Science of Computer Programming* (Special Issue TASE 2022), 231, 2024

Corto Mascle, Daniel Neider, Maximilian Schwenger, Paulo Tabuada, Alexander Weinert, and Martin Zimmermann: **From LTL to rLTL Monitoring: Improved Monitorability through Robust Semantics**. *Formal Methods in System Design*, 59, 2021

Daniel Neider, Alexander Weinert, and Martin Zimmermann: **Robust, Expressive, and Quantitative Linear Temporal Logics: Pick any Two for Free**. *Information and Computation* (Special Issue GandALF 2019), 285(B), 2022

Martin Zimmermann: **Approximating the Minimal Lookahead Needed to Win Infinite Games**. *Information Processing Letters*, 177, 2022

Karoliina Lehtinen and Martin Zimmermann: **Good-for-games ω-Pushdown Automata**. *Logical Methods in Computer Science*, 18(1), 2022

Sarah Winter and Martin Zimmermann: **Finite-state Strategies in Delay Games**. *Information and Computation* (Special Issue GandALF 2017), 272, 2020

Daniel Neider, Alexander Weinert, and Martin Zimmermann: **Synthesizing Optimally Resilient Controllers**. *Acta Informatica* 57(1), 2020

Sven Schewe, Alexander Weinert, and Martin Zimmermann: **Parity Games with Weights**. *Logical Methods in Computer Science* (Special Issue CSL 2018), 15(3), 2019

Alexander Weinert and Martin Zimmermann: **Visibly Linear Dynamic Logic**. *Theoretical Computer Science*, 747, 2018

Swen Jacobs, Leander Tentrup, and Martin Zimmermann: **Distributed Synthesis for Parameterized Temporal Logics**. *Information and Computation* (Special Issue GandALF 2016), 262(2), 2018

Hazem Torfah and Martin Zimmermann: **The Complexity of Counting Models of Linear-time Temporal Logic**. *Acta Informatica*, 55(3), 2018

Martin Zimmermann: **Parameterized Linear Temporal Logics Meet Costs: Still not Costlier than LTL**. *Acta Informatica* (Special Issue GandALF 2015), 55(2), 2018

Alexander Weinert and Martin Zimmermann: **Easy to Win, Hard to Master: Optimal Strategies in Parity Games with Costs**. *Logical Methods in Computer Science*, 13(3), 2017

Peter Faymonville and Martin Zimmermann: **Parametric Linear Dynamic Logic**. *Information and Computation* (Special Issue GandALF 2014), 253(3), 2017

Martin Zimmermann: **Delay Games with WMSO+U Winning Conditions**. *RAIRO ITA*, 50(2), 2016

Felix Klein and Martin Zimmermann: **How Much Lookahead is Needed to Win Infinite Games?**. *Logical Methods in Computer Science*, 12(3), 2016

Florian Horn, Wolfgang Thomas, Nico Wallmeier, and Martin Zimmermann: **Optimal Strategy Synthesis for Request-Response Games**. *RAIRO ITA*, 49(3), 2015

Daniel Neider, Roman Rabinovich, and Martin Zimmermann: **Down the Borel Hierarchy: Solving Muller Games via Safety Games**. *Theoretical Computer Science* (Special Issue GandALF 2012), 560, 2014

Nathanaël Fijalkow and Martin Zimmermann: **Parity and Streett Games with Costs**. *Logical Methods in Computer Science*, 10(2), 2014

Martin Zimmermann: **Optimal Bounds in Parametric LTL Games**. *Theoretical Computer Science* (Special Issue GandALF 2011), 493, 2013

John Fearnley and Martin Zimmermann: **Playing Muller Games in a Hurry**. *International Journal of Foundations of Computer Science* (Special Issue GandALF 2010), 23(3), 2012

Conference Papers Martin Fränzle, Sarah Winter, and Martin Zimmermann: **Strategies Resilient to Delay: Games under Delayed Control vs. Delay Games**. In "Proceedings of GandALF 2023", volume 390 of *EPTCS*, 2023

Aniello Murano, Daniel Neider, and Martin Zimmermann: **Robust Alternating-time Temporal Logics**. In "Proceedings of JELIA 2023", volume 14281 of *LNCS*, 2023

Enzo Erlich, Shibashis Guha, Ismaël Jecker, Karoliina Lehtinen, and Martin Zimmermann: **History-deterministic Parikh Automata**. In "Proceedings of CONCUR 2023", volume 279 of *LIPIcs*, 2023

Sarah Winter and Martin Zimmermann: **Weak Muller Conditions Make Delay Games Hard**. In "Aspects of Computation and Automata Theory with Applications", volume 42 of *Lecture Notes Series, Institute for Mathematical Sciences, National University of Singapore*, 2023

Shibashis Guha, Ismaël Jecker, Karoliina Lehtinen, and Martin Zimmermann: **Parikh Automata over Infinite Words**. In *Proceedings of FSTTCS 2022*, volume 250 of *LIPIcs*, 2022

Satya Prakash Nayak, Daniel Neider, and Martin Zimmermann: **Robustness-by-Construction Synthesis: Adapting to the Environment at Runtime**. In *Proceedings of ISOLA 2022*, volume 13701 of *LNCS*, 2022

Thomas Møller Grosen, Sean Kauffman, Kim G. Larsen, and Martin Zimmermann: **Monitoring Timed Properties (Revisited)**. In *Proceedings of FORMATS 2022*, volume 13465 of *LNCS*, 2022

Sean Kauffman and Martin Zimmermann: **The Complexity of Evaluating nfer**. In *Proceedings of TASE 2022*, volume 13299 of *LNCS*, 2022

Satya Prakash Nayak, Daniel Neider, Rajarshi Roy, and Martin Zimmermann: **Robust Computation Tree Logic**. In *Proceedings of NFM 2022*, volume 13260 of *LNCS*, 2022

Marie Fortin, Louwe B. Kuijer, Patrick Totzke, and Martin Zimmermann: **HyperLTL Satisfiability is Σ_1^1-complete, HyperCTL* Satisfiability is Σ_1^2-complete**. In *Proceedings of MFCS 2021*, volume 202 of *LIPIcs*, 2021

Shibashis Guha, Ismaël Jecker, Karoliina Lehtinen, and Martin Zimmermann: **A Bit of Nondeterminism Makes Pushdown Automata Expressive and Succinct**. In *Proceedings of MFCS 2021*, volume 202 of *LIPIcs*, 2021

Aniello Murano, Sasha Rubin, and Martin Zimmermann: **Optimal Strategies in Weighted Limit Games**. In *Proceedings of GandALF 2020*, volume 326 of *EPTCS*, 2020

Daniel Neider, Patrick Totzke, and Martin Zimmermann: **Optimally Resilient Strategies in Pushdown Safety Games**. In *Proceedings of MFCS 2020*, volume 170 of *LIPIcs*, 2020

Karoliina Lehtinen and Martin Zimmermann: **Good-for-games ω-Pushdown Automata**. In *Proceedings of LICS 2020*, ACM, 2020

Corto Mascle, Daniel Neider, Maximilian Schwenger, Paulo Tabuada, Alexander Weinert, and Martin Zimmermann: **From LTL to rLTL Monitoring: Improved Monitorability through Robust Semantics**. In *Proceedings of HSCC 2020*, ACM, 2020

Swen Jacobs, Mouhammad Sakr, and Martin Zimmermann: **Promptness and Bounded Fairness in Concurrent and Parameterized Systems**. In *Proceedings of VMCAI 2020*, volume 11990 of *LNCS*, 2020

Corto Mascle and Martin Zimmermann: **The Keys to Decidable HyperLTL Satisfiability: Small Models or Very Simple Formulas**. In *Proceedings of CSL 2020*, volume 152 of *LIPIcs*, 2020

Daniel Neider, Alexander Weinert, and Martin Zimmermann: **Robust, Expressive, and Quantitative Linear Temporal Logics: Pick any Two for Free**. In *Proceedings of GandALF 2019*, volume 305 of *EPTCS*, 2019

Sven Schewe, Alexander Weinert, and Martin Zimmermann: **Parity Games with Weights**. In *Proceedings of CSL 2018*, volume 119 of *LIPIcs*, 2018

Daniel Neider, Alexander Weinert, and Martin Zimmermann: **Synthesizing Optimally Resilient Controllers**. In *Proceedings of CSL 2018*, volume 119 of *LIPIcs*, 2018

Matthew Hague, Roland Meyer, Sebastian Muskalla, and Martin Zimmermann: **Parity to Safety in Polynomial Time for Pushdown and Collapsible Pushdown Systems**. In *Proceedings of MFCS 2018*, volume 117 of *LIPIcs*, 2018

Andreas Krebs, Arne Meier, and Jonni Virtema, and Martin Zimmermann: **Team Semantics for the Specification and Verification of Hyperproperties**. In *Proceedings of MFCS 2018*, volume 117 of *LIPIcs*, 2018

Martin Zimmermann: **Finite-state Strategies in Delay Games**. In *Proceedings of GandALF 2017*, volume 256 of *EPTCS*, 2017

Martin Zimmermann: **Games with Costs and Delays**. In *Proceedings of LICS 2017*, IEEE Computer Society, 2017

Patricia Bouyer, Piotr Hofman, Nicolas Markey, Mickael Randour, and Martin Zimmermann: **Bounding Average-energy Games**. In *Proceedings of FOSSACS 2017*, volume 10203 of *LNCS*, 2017

Bernd Finkbeiner and Martin Zimmermann: **The First-Order Logic of Hyperproperties**. In *Proceedings of STACS 2017*, volume 66 of *LIPIcs*, 2017

Felix Klein and Martin Zimmermann: **Prompt Delay**. In *Proceedings of FSTTCS 2016*, volume 65 of *LIPIcs*, 2016

Alexander Weinert and Martin Zimmermann: **Visibly Linear Dynamic Logic**. In *Proceedings of FSTTCS 2016*, volume 65 of *LIPIcs*, 2016

Kim G. Larsen, Simon Laursen, and Martin Zimmermann: **Limit your Consumption! Finding Bounds in Average-energy Games**. In *Proceedings of QAPL 2016*, volume 227 of *EPTCS*, 2016

Leander Tentrup, Alexander Weinert, and Martin Zimmermann: **Approximating Optimal Bounds in Prompt-LTL Realizability in Doubly-exponential Time**. In *Proceedings of GandALF 2016*, volume 226 of *EPTCS*, 2016

Swen Jacobs, Leander Tentrup, and Martin Zimmermann: **Distributed PROMPT-LTL Synthesis**. In *Proceedings of GandALF 2016*, volume 226 of *EPTCS*, 2016

Alexander Weinert and Martin Zimmermann: **Easy to Win, Hard to Master: Optimal Strategies in Parity Games with Costs**. In *Proceedings of CSL 2016*, volume 62 of *LIPIcs*, 2016

Martin Zimmermann: **Parameterized Linear Temporal Logics Meet Costs: Still not Costlier than LTL**. In *Proceedings of GandALF 2015*, volume 193 of *EPTCS*, 2015

Felix Klein and Martin Zimmermann: **What are Strategies in Delay Games? Borel Determinacy for Games with Lookahead**. In *Proceedings of CSL 2015*, volume 41 of *LIPIcs*, 2015

Martin Zimmermann: **Delay Games with WMSO+U Winning Conditions**. In *Proceedings of CSR 2015*, volume 9139 of *LNCS*, 2015

Felix Klein and Martin Zimmermann: **How Much Lookahead is Needed to Win Infinite Games?**. In *Proceedings of ICALP 2015, part II*, volume 9135 of *LNCS*, 2015

Hazem Torfah and Martin Zimmermann: **The Complexity of Counting Models of Linear-time Temporal Logic**. In *Proceedings of FSTTCS 2014*, volume 29 of *LIPIcs*, 2014

Peter Faymonville and Martin Zimmermann: **Parametric Linear Dynamic Logic**. In *Proceedings of GandALF 2014*, volume 161 of *EPTCS*, 2014

Nathanaël Fijalkow and Martin Zimmermann: **Cost-Parity and Cost-Streett Games**. In *Proceedings of FSTTCS 2012*, volume 18 of *LIPIcs*, 2012

Wladimir Fridman and Martin Zimmermann: **Playing Pushdown Parity Games in a Hurry**. In *Proceedings of GandALF 2012*, volume 96 of *EPTCS*, 2012

Daniel Neider, Roman Rabinovich, and Martin Zimmermann: **Down the Borel Hierarchy: Solving Muller Games via Safety Games**. In *Proceedings of GandALF 2012*, volume 96 of *EPTCS*, 2012

Wladimir Fridman, Christof Löding, and Martin Zimmermann: **Degrees of Lookahead in Context-free Infinite Games**. In *Proceedings of CSL 2011*, volume 12 of *LIPIcs*, 2011

Martin Zimmermann: **Optimal Bounds in Parametric LTL Games**. In *Proceedings of GandALF 2011*, volume 54 of *EPTCS*, 2011

John Fearnley and Martin Zimmermann: **Playing Muller Games in a Hurry**. In *Proceedings of GandALF 2010*, volume 25 of *EPTCS*, 2010

Martin Zimmermann: **Time-optimal Winning Strategies for Poset Games**. In *Proceedings of CIAA 2009*, volume 5642 of *LNCS*, 2009

Posters Satya Prakash Nayak, Daniel Neider, and Martin Zimmermann: **Adaptive Strategies for rLTL Games**. In *Proceedings of HSCC 2021*, ACM, 2021

Theses Martin Zimmermann: **Tradeoffs in Infinite Games**. Habilitation Thesis, Saarland University, 2018

Martin Zimmermann: **Solving Infinite Games with Bounds**. PhD Thesis, RWTH Aachen University, 2012

Martin Zimmermann: **Time-optimal Winning Strategies in Infinite Games**. Diploma Thesis, RWTH Aachen University, 2009

Talks Slides are available on my homepage.

Synthesis of Infinite-state Systems FMCPS 2023

On Parikh Automata: Infinite Words, Games, and History-determinism Highlights 2022

A Bit of Nondeterminism Makes Pushdown Automata Expressive and Succinct Highlights 2021

How undecidable are HyperLTL and HyperCTL*? Highlights 2021

Optimal Strategies in Weighted Limit Games GandALF 2020

Optimally Resilient Strategies in Pushdown Safety Games MFCS 2020, Highlights 2020

Temporal Logics for Information-flow Policies Royal Holloway 2020, NetVAS 2022, FMCPS 2023

Robust, Expressive, and Quantitative Linear Temporal Logics: Pick any Two for Free GandALF 2019

Synthesizing Optimally Resilient Strategies Highlights 2018

Finite-state Strategies in Delay Games GandALF 2017

The First-order Logic of Hyperproperties Centre Fédéré en Vérification (Brussels) 2017, RWTH Aachen University 2017, STACS 2017, Leibniz University Hannover 2017, Highlights 2017

Easy to Win, Hard to Master: Playing Parity Games with Costs Optimally AVeRTS 2016, University of Liverpool 2017

Prompt Delay FSTTCS 2016

Distributed Prompt-LTL Synthesis GandALF 2016

Visibly Linear Dynamic Logic Highlights 2016, FSTTCS 2016

Approximating Optimal Bounds in Prompt-LTL Realizability in Doubly-exponential Time QAPL 2016

Limit your Consumption! Finding Bounds in Average-energy Games QAPL 2016

Unbounded Lookahead in WMSO+U Games University of Warsaw 2015

Parameterized Linear Temporal Logics Meet Costs: Still not Costlier than LTL GandALF 2015

What are Strategies in Delay Games? Borel Determinacy for Games with Lookahead CSL 2015

Delay Games with WMSO+U Winning Conditions Dagstuhl 2015, Avacs Meeting 2015, CSR 2015, Highlights 2015

Parametric Linear Temporal Logics Aalborg 2015

Infinite Games University of Oldenburg 2014 (invited)

Optimal Strategy Synthesis for Request-Response Games AVACS Meeting 2014

The Complexity of Counting Models of Linear-time Temporal Logic Highlights 2014, RWTH Aachen University 2015

How much Lookahead is Needed to Win Infinite Games? Algosyn/PUMA Meeting 2014, ACTS 2015, Aalborg University 2015, University of Napoli 2018

Cost-Parity and Cost-Streett Games RWTH Aachen University 2012, TU München 2013, Saarland University 2013

Playing Pushdown Parity Games in a Hurry AISS 2012, GandALF 2012, Games 2012

Down the Borel Hierarchy Solving Muller Games via Safety Games University of Warsaw 2011, Algosyn Workshop 2011, Gasics Meeting 2011, LICS 2012, AVACS Meeting 2014

Degrees of Lookahead in Context-free Infinite Games AlMoTh 2011, Gasics Meeting 2011, Games 2011

Playing Muller Games in a Hurry Gasics Meeting 2010, GandALF 2010, MoVeP 2010, Games 2010

Time-optimal Strategies for Infinite Games Warwick University 2010

Optimal Bounds in Parametric LTL Games Games 2009, Gasics Meeting 2009, AlMoTh 2010, Gasics Meeting 2010, GandALF 2011, AVACS Meeting 2013

Time-optimal Winning Strategies for Poset Games Gasics Meeting 2009, CIAA 2009

Teaching

from 2024	Lecture **Introductory Programming for Data Science**
from 2024	Lecture **Computability and Complexity**
since 2023	Lecture **Algorithms and Computability** (taught twice)
since 2021	Lecture **Computer Architecture and Operating Systems** (taught thrice)

2019 - 2021	Lecture **COMP313: Formal Methods** (taught thrice)
Winter 2017/2018	Lecture **Reactive Synthesis** (co-taught with S. Jacobs)
Summer 2016	Lecture **Infinite Games**
Summer 2015	Lecture **Recursion Theory**
Summer 2014	Seminar **Advanced Topics in Infinite Games** (co-taught with B. Finkbeiner)
Winter 2013/14	Lecture **Infinite Games**
Summer 2013	Lecture **Verification** (co-taught with B. Finkbeiner)

Supervision

2022	Enzo Erlich (internship)
2020 - 2021	Satya Prakash Nayak (internship and master thesis)
2019-2021	Marie Fortin (postdoc)
2019	Corto Mascle (internship)
2015 - 2018	Alexander Weinert (PhD student)
2017	Moritz Lichter (research immersion lab)
2015	Tobias Salzmann (master thesis)

PhD Committees

2023	Andrej Kiviriga (Aalborg University)
2021	Anibar Majumdar (Université Paris-Saclay)
2018	Quentin Hautem (University of Mons)
2017	Alexander Wieder (Saarland University)
2016	Hassan Hatefi Ardakani (Saarland University)
2014	Rayna Dimitrova (Saarland University)
2013	Rüdiger Ehlers (Saarland University)

Reviewing

Journals	JCSS, SICOMP, I&C, LMCS, TCS, Acta Informatica, TAC, TOCS, TOCL, JLC, FMSD, InfoSys, IJFCS, theoretiCS
Conferences	RP 2009, LPAR 2010, MFCS 2010, LICS 2010, LATA 2010, FSTTCS 2010, CSL 2011, FSTTCS 2011, LICS 2013, ICALP 2013, TIME 2013, STACS 2014, TACAS 2014, FOSSACS 2014, CAV 2014, YuriFest 2015, STACS 2016, LICS 2016, ATVA 2016, ESOP 2017, STACS 2018, FOSSACS 2018, MFCS 2018, RP 2019, ATVA 2019, FSTTCS 2019, STACS 2020, MFCS 2020, FSTTCS 2020, LICS 2021, MFCS 2021, WOLLIC 2021, FOSSACS 2022, TACAS 2022, LICS 2022, NFM 2022, MFCS 2022, FSTTCS 2022, TACAS 2023, ICALP 2023, AAMAS 2024, LPAR 2024
2014 - 2020	Reviewer for Mathematical Reviews.

May 3, 2024