



GandALF 2021

12th International Symposium
on Games, Automata, Logics, and Formal Verification

OVERLAY 2021

3rd Workshop on Artificial Intelligence and
fOrmal VERification, Logic, Automata, and sYnthesis

September 20-22, 2021
University of Padova, Department of Mathematics
Padova, Italy



UNIVERSITÀ
DEGLI STUDI
DI PADOVA



DIPARTIMENTO
MATEMATICA

DIPARTIMENTO DI MATEMATICA "TULLIO LEVI-CIVITA"

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About

GandALF

The International Symposium on Games, Automata, Logics, and Formal Verification was established by a group of Italian computer scientists to provide an opportunity for researchers interested in mathematical logic, automata theory, game theory, to gather and discuss the application of formal methods to the specification, design, and verification of complex systems.

It is a forum where people from different areas, and possibly with different backgrounds, can fruitfully interact, with a truly international spirit, as witnessed by the composition of the program and steering committee and by the country distribution of the submitted papers.

Program Chairs

- Davide Bresolin, University of Padova (Italy)
- Pierre Ganty, IMDEA Software Institute, Madrid (Spain)

OVERLAY

This year the GandALF Symposium is co-located with the 3rd Workshop on Artificial Intelligence and fOrmal VERification, Logic, Automata, and sYnthesis. The event aims at establishing a stable, long-term scientific forum on relevant topics connected to the relationships between Artificial Intelligence and Formal Methods, by providing a stimulating environment where researchers can discuss about opportunities and challenges at the border of the two areas.

Important goals of the workshop are (i) to encourage the ongoing interaction between the formal methods and artificial intelligence communities, (ii) to identify innovative tools and methodologies, and (iii) to elicit a discussion on open issues and new challenges.

Program Chairs

- Dario Della Monica, University of Udine (Italy)
- Gian Luca Pozzato, University of Torino (Italy)
- Enrico Scala, University of Brescia (Italy)

Monday, September 20

8:40–8:55	Registration
8:55–9:00	Welcome remarks
9:00–10:00	Invited Talk 1 – Anca Muscholl: “Sound negotiations”
10:00–10:45	Coffee break
10:45–12:30	Session 1 – Verification and Synthesis Javier Esparza, Mikhail Raskin and Christoph Welzel: “Abduction of trap invariants in parameterized systems” A. R. Balasubramanian and Chana Weil-Kennedy: “Reconfigurable Broadcast Networks and Asynchronous Shared-Memory Systems are Equivalent” Simon Jantsch, Jakob Piribauer and Christel Baier: “Witnessing subsystems for probabilistic systems with low tree width” Dhananjay Raju, Ruediger Ehlers and Ufuk Topcu: “Adapting to the Behavior of Environments with Bounded Memory”
12:30–14:15	Lunch
14:15–15:35	Session 2 – Games Erich Grädel, Niels Lücking and Matthias Naaf: “Semiring Provenance for Büchi Games: Strategy Analysis with Absorptive Polynomials” Tobias Winkler and Maximilian Weininger: “Stochastic Games with Disjunctions of Multiple Objectives” Antti Kuusisto and Raine Rönholm: “The optimal way to play the most difficult repeated coordination games”
15:35–16:20	Coffee break
16:20–17:40	Session 3 – LTL Shufang Zhu, Lucas Martinelli Tabajara, Geguang Pu and Moshe Vardi: “Temporal Knowledge Compilation for Realizability Checking and Synthesis” Florian Gallay and Ylies Falcone: “Decentralized LTL Enforcement” Alessandro Cimatti, Luca Geatti, Nicola Gigante, Angelo Montanari and Stefano Tonetta: “Expressiveness of Extended Bounded Response LTL”

Tuesday, September 21

- 9:00–10:00 **Invited Talk 2 – Nicola Olivetti: “Non-normal modal logics vindicated ”**
- 10:00–10:45 Coffee break
- 10:45–12:30 **Session 4 – Logic 1**
Raoul Koudijs: “Finite Model Property and Bisimulation for Local Logics of Dependence”
Laura Bozzelli, Angelo Montanari, Adriano Peron and Pietro Sala: “Adding the relation Meets to the temporal logic of prefixes and infixes makes it EXPSPACE-complete”
Domenico Cantone, Andrea De Domenico and Pietro Maugeri: “On the convexity of a fragment of pure set theory with applications within a Nelson-Oppen framework”
Jan Rooduijn and Yde Venema: “Filtration and canonical completeness for the continuous modal μ -calculus”
- 12:30–14:15 Lunch
- 14:15–15:15 **Invited Talk 3 – Sicco Verwer: “State machine learning in practice using Flexfringe: flexibility, use-cases, and interpretability”**
- 15:15–16:00 Coffee break
- 16:00–17:20 **Session 5 – Automata**
Ashwani Anand, Nathanaël Fijalkow, Aliénor Goubault-Larrecq, Leroux Jérôme and Pierre Ohlmann: “New Algorithms for Combinations of Objectives using Separating Automata”
Gustav Grabolle: “A Nivat theorem for weighted alternating automata over commutative semirings”
Miikka Vilander: “Games for Succinctness of Regular Expressions”
- 17:45–19:00 **Visit to the Scrovegni Chapel**
- 20:00 **Social dinner at “Ristorante Ai Navigli”**

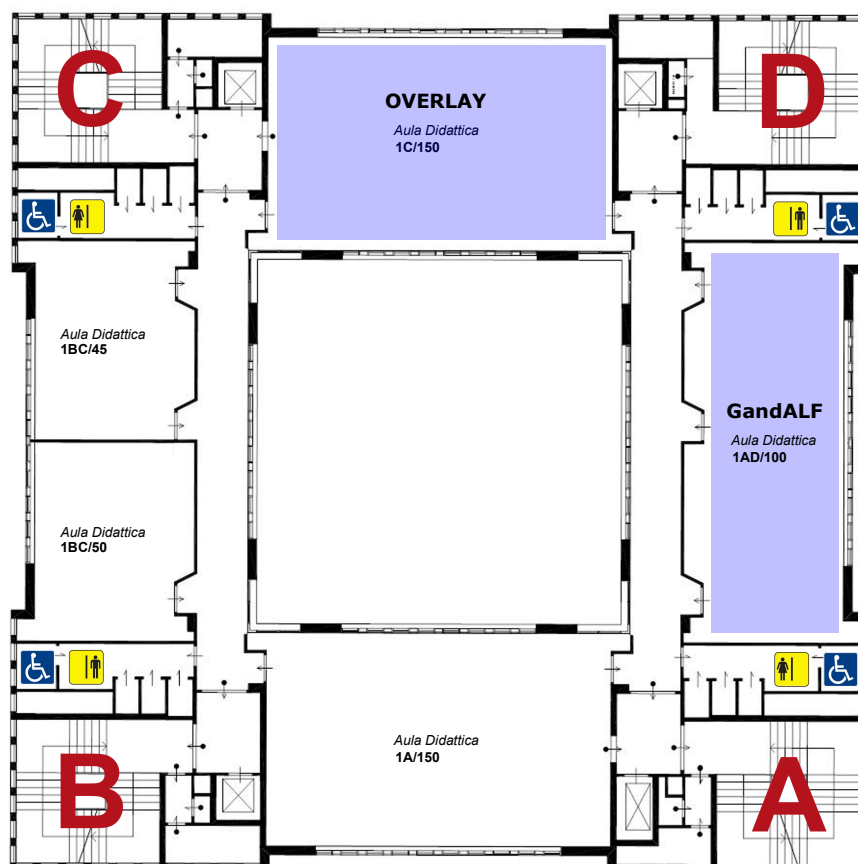
Wednesday, September 22

9:00–10:00	GandALF/OVERLAY Joint Invited Talk Roderick Bloem: “Shield Synthesis for Safe Reinforcement Learning”	
10:00–10:45	Coffee break	
10:45–11:45	Session 6 – Logic 2 Giovanni Pagliarini and Guido Sciavicco: “Decision Tree Learning with Spatial Modal Logics” Clemens Kupke, Johannes Marti and Yde Venema: “On the Size of Disjunctive Formulas in the μ -calculus” Gandalf 2021 Closing	Overlay 1 – Planning and Temporal Reasoning Franc Ivankovic, Marco Roveri: “Planning with Global State Constraints for Urban Traffic Control” Luca Geatti, Nicola Gigante, Angelo Montanari: “BLACK: A Fast, Flexible and Reliable LTL Satisfiability Checker” Salvatore La Torre, Gennaro Parlato: “Automated Planning Through Program Verification” Giulio Mazzi, Alberto Castellini, Alessandro Farinelli: “Rule-based Shield Synthesis for Partially Observable Monte Carlo Planning”
11:45–12:45	Overlay 2 – Analysis of complex models Aliyu Tanko Ali, Damas Gruska: “Dynamic Attack Trees” Guido Sciavicco, Tiziano Villa, Matteo Zavatteri: “Mining Temporal Networks: Results and Open Problems” Giovanni Pagliarini, Guido Sciavicco, Ionel Eduard Stan: “Multi-Frame Modal Symbolic Learning” Serenella Cerrito, Valentin Goranko, Sophie Paillocher: “Synthesizing model completions from temporal logic specifications with incomplete knowledge”	
12:45–14:30	Lunch	
14:30–15:30	Overlay 3 – Reasoning and Verification Alessandro Gianola, Marco Montali, Matteo Papini: “Automated Reasoning for Reinforcement Learning Agents in Structured Environments” Rachid Adrdor, Lahcen Koutti: “Using Directional Arc Consistency with Asynchronous Forward-Bounding algorithm” Angela Pappagallo: “Statistical Model Checking for the Analysis of Mission- and Safety-Critical Cyber-Physical Systems” Sylvain Conchon, Giorgio Delzanno, Arnaud Sangnier: “On the Parameterized Verification of Abstract Models of Contact Tracing Protocols”	

- 15:30–16:30 Overlay 4 – Learning, neural networks, and their applications**
 Marco Sälzer, Georg Siebert: “Towards Learning From Graph Representable Formal Models”
 Alessandro Abate, Daniele Ahmed, Alec Edwards, Mirco Giacobbe, Andrea Peruffo: “A Software Tool for the Formal Synthesis of Lyapunov Functions and Barrier Certificates using Neural Networks”
 Jannik Dunkelau, Leo Baldus: “Ranking Model Checking Backends for Automated Selection via Classification and Regression Learning”
 Laura Giordano, Valentina Gliozzi, Daniele Theseider Dupré: “Preferential Reasoning with Typicality and Neural Network Models”
- 16:30–17:15 Coffee break**
- 17:15–18:15 Overlay 5 – Tools and Applications**
 Anna Becchi, Alessandro Cimatti, Enea Zaffanella: “Reverse engineering with P-stable Abstractions”
 Marco Esposito: “AI-guided optimal deployments of drone-intercepting systems in large critical areas”
 Benedikt Boeing, Rajarshi Roy, Daniel Neider, Emmanuel Müller: “QUGA - Quality Guarantees for Autoencoders”
 Marco Esposito, Leonardo Picchiami: “Simulation-Based Synthesis of Personalised Therapies for Colorectal Cancer”
- 18:15–18:30 Overlay 2021 Closing**

Useful Information

Talks of the GandALF conference will be held in **Room 1AD/100** of the Department of Mathematics, located at Via Trieste 63, Padova. The invited talk of Wednesday 22 and talks of the OVERLAY workshop will be held in **Room 1C/150**. Both rooms are situated on the first floor of the department building and have access through stairs “A” located at the ground floor, main entrance of the Department.



Coffee breaks will be offered on the space with the red tables at the **ground floor** in front of the main entrance of the Department.

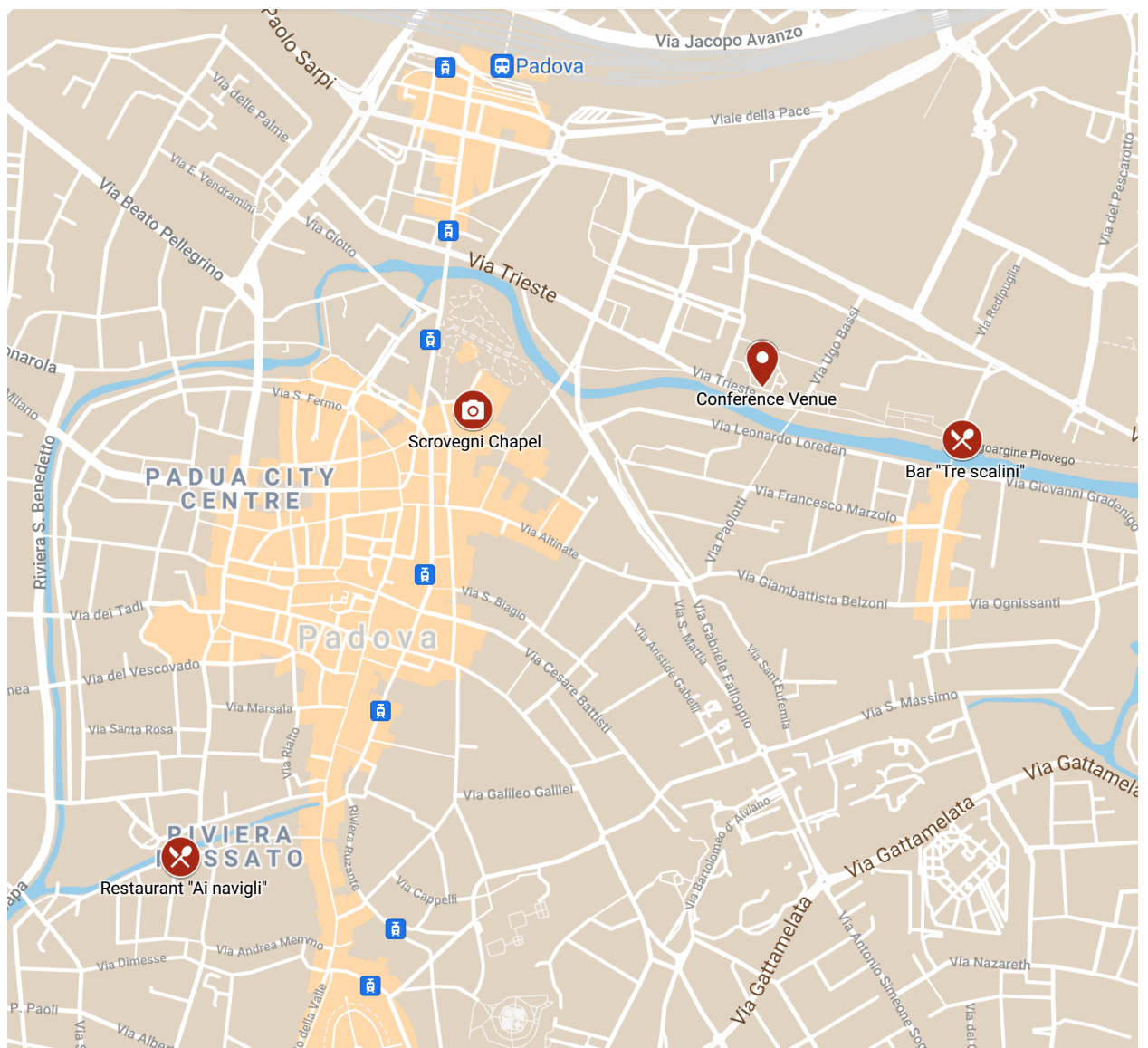
Lunches will be offered at the “Bar Tre Scalini”, located at Via Venezia, 2, Padova, 5 minute walk from the Department.

Wi-Fi will be available during the conference. All rooms provides access to the eduroam network.

Social event and conference dinner

The **social event** is a visit to the Scrovegni Chapel, a masterpiece in the history of painting in Italy and Europe in the 14th century, considered to be the most complete series of frescoes executed by Giotto in his mature age. The entrance to the chapel is at the Eremitani Museum, at Piazza Eremitani, 8, Padova.

The **conference dinner** will be held at the “Ristorante Ai Navigli”, at Riviera Tiso da Camposampiero, 11, Padova.



Acknowledgments

The GandALF conference and the OVERLAY workshop acknowledge the support of the Department of Mathematics of the University of Padova and of “Gruppo Nazionale per il Calcolo Scientifico (GNCS-INDAM)”.



