

8th International Conference on Formal Structures for Computation and Deduction



03 – 06 JULY, 2023

ROME, ITALY

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CONTENTS



FSCD covers all aspects of formal structures for computation and deduction from theoretical foundations to applications. Building on two communities, RTA (Rewriting Techniques and Applications) and TLCA (Typed Lambda Calculi and Applications), FSCD embraces their core topics and broadens their scope to closely related areas in logics, proof theory and new emerging models of computation such as quantum computing or homotopy type theory.

The 8th FSCD (International Conference on Formal Structures for Computation and Deduction) will be held in Rome, July 3-6, 2023, with workshops on the preceding two days.

FSCD is a series of annual conferences, started in 2016, which merged and superseded two long-running conferences

- RTA (Rewriting Techniques and Applications), celebrated since 1985.
- TLCA (Typed Lambda Calculi and Applications), celebrated since 1993.

Building on the RTA and TLCA communities, FSCD updates and modernizes the RTA and TLCA core topics and broadens their scope to closely related areas in logics, models of computation (e.g. quantum computing, probabilistic computing, homotopy type theory), semantics and verification in new challenging areas.

FSCD 2023 will be co-located with CADE-29.

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**Maribel Fernandez (Joint FSCD-CADE)
King's College London**

Title: Nominal Techniques for Software Specification and Verification

Abstract: The nominal approach to the specification of languages with binding operators, introduced by Gabbay and Pitts, has its roots in nominal set theory. With a user-friendly first-order syntax, nominal logic provides a formal framework to reason about binding operators similar to

conventional, on-paper reasoning. Indeed, nominal logic uses the well-understood concept of permutation groups acting on sets to provide a rigorous first-order treatment for the common informal practice of fresh and bound names.

In this talk, I will present our current work towards incorporating nominal techniques into two widely-used rule-based first-order verification environments: the K specification framework and the Maude programming environment.

An important component of rule-based programming and verification environments is the unification algorithm used to solve equational problems. In practice, unification problems are solved in the context of equational axioms. In the first part of the talk we will discuss nominal unification modulo equational theories. In particular, we will discuss nominal unification modulo associativity and commutativity, and the use of nominal narrowing to deal with theories presented by convergent rewrite rules.

Another important component of verification environments is the type system. In the second part of the talk we will discuss type systems for nominal languages (including polymorphic systems and intersection systems). Dependent type theories, the dominant approach to formalising programming languages, have also been extended with nominal features. A lambda-less nominal dependent type system is available and we are currently working on a type checker for this system.

The talk will be structured as follows: we will start with the definition of nominal logic (including the notions of fresh atoms and alpha-equivalence) followed by a brief introduction to nominal matching and unification. We will then define nominal rewriting, a generalisation of first-order rewriting that provides in-built support for alpha-equivalence following the nominal approach. Finally, we will discuss notions of nominal unification and rewriting modulo associative and commutative operators and briefly overview typed versions of nominal languages.

KEYNOTE SPEAKERS



Mateja Jamnik (Joint FSCD-CADE)
University of Cambridge, UK (Department of Computer Science and Technology)

Title: How can we trust AI?

Abstract: Not too long ago most headlines talked about our fear of AI. Today, AI is ubiquitous, and the conversation has moved on from whether we should use AI to how we can trust the AI systems that we use in our daily lives. In this talk I look at some key technical ingredients that help us build confidence and

trust in using intelligent technology. I argue that intuitiveness, interaction, explainability and inclusion of human domain knowledge are essential in building this trust. I present some of the techniques and methods we are building for making AI systems that think and interact with humans in more intuitive and personalised ways, enabling humans to better understand the solutions produced by machines, and enabling machines to incorporate human domain knowledge in their reasoning and learning processes.

Bio: Mateja Jamnik is Professor of Artificial Intelligence at the University of Cambridge, UK. She is developing AI techniques for human-like computing – she combines AI reasoning with machine learning techniques in order to advance the explainability of AI systems, and applies them to personalised medicine and tutoring systems. Mateja is passionate about bringing science closer to the public and engages frequently with the media and outreach events. She has been advising the UK government on policy direction in relation to the impact of AI on society.



Giulio Manzonetto
LIPN&CNRS, Université Sorbonne Paris Nord

Title: A Lambda Calculus Satellite

Abstract: Barendregt's book "The Lambda Calculus, its syntax and semantics" (1981/84) has become a 'classic' in Theoretical Computer Science because it presents the state of the art in lambda calculus at that time in a comprehensive way. Moreover, a number of open problems and conjectures were proposed. In

2022, Barendregt and Manzonetto published a 'sequel' of this book, presenting the solutions of several of these problems, and more. In this talk, I will present a selection of these problems and the key ingredients that were employed in their solutions.



Akihisa Yamada
**Cyber Physical Security Research Center, National Institute of
Advanced Industrial Science and Technology (AIST)**

Title: Termination of Term Rewriting: Foundation, Formalization, Implementation, and Competition

Abstract: Automated termination analysis is a central topic in the research of term rewriting. In this talk, I will first review the theoretical foundation of termination of term rewriting, leading to the recently established tuple interpretation method.

Then I will present an Isabelle/HOL formalization of the theory. Although the formalization is based on the existing library IsaFoR (Isabelle Formalization of Rewriting), the present work takes another approach of representing relations (predicates rather than sets) so that the notation is more human friendly.

Then I will present a unified implementation of the termination analysis techniques via SMT encoding, leading to the termination prover NaTT. Many tools have been developed for termination analysis and have been competing annually in termCOMP (Termination Competition) for two decades. At the end of the talk, I will share my experience in organizing termCOMP in the last five years.



SAT 1st Jul	SUN 2nd Jul	MON 3rd Jul	TUE 4th Jul	WED 5th Jul	THU 6th Jul
CADE	CADE	CADE	CADE		
		FSCD	FSCD	FSCD	FSCD
TLLA	TLLA	CASC		SMT	SMT
LSFA	LSFA		HOR	AdeMaL	
WIL	DCM			THeDu	
WPTE	LFMTP			Vampire	
	UNIF			IFIP WG 1.6	
CADE welcome	CADE business meeting	CADE excursion & dinner			
	FSCD welcome	FSCD optional excursion & dinner		FSCD general meeting	



Location: Room 7

09:00	TBA Gabriele Vanoni
10:00-10:30	Coffee break
10:30	Towards injectivity of the coherent model for connected MELL proof-nets Antonio Bucciarelli, Raffaele Di Donna, Lorenzo Tortora de Falco
10:55	Rémi Di Guardia, Olivier Laurent, Lorenzo Tortora de Falco, Lionel Vaux Auclair Sequentialization is as fun as bungee jumping
11:20	Linear realisability over nets and second order quantification Adrien Ragot, Thomas Seiller, Lorenzo Tortora de Falco
11:45	Multiplicative Logic Beyond Cographs Matteo Acclavio
12:10	Confluence for untyped proof nets via parallel cut elimination Giulio Guerrieri, Giulia Manara, Lorenzo Tortora de Falco, Lionel Vaux Auclair
12:35-14:00	Lunch break
14:00	TBA Alexis Saurin
15:30-16:30	Coffee break
16:30	The exponential logic of sequentialization Aurore Alcolei, Luc Pellissier, Alexis Saurin
16:55	Non-uniform polynomial time via non-wellfounded parsimonious proofs Matteo Acclavio, Gianluca Curzi, Giulio Guerrieri
17:20	Some notes on the beginning of Linear Logic in Italy Antonio Veredice
17:45	Normal functors[ions], [the irrelevance of] power series, and [a new model of] λ-calculus Morgan Rogers, Thomas Seillerc, William Toiani

Location: Room 7

09:00	TBA Zeinab Gabal / Marcelo Fiore
10:00-10:30	Coffee break
10:30	Tropical Mathematics and the Lambda-Calculus Davide Barbarossa, Paolo Pistone
10:55	Linear Realizability and Cobordisms Valentin Mastracci, Thomas Seiller
11:20	Unifying Graded Linear Logic and Differential Operators Flavien Breuvert, Marie Kerjean, Simon Mirwasser
11:45	Functorial Models of Differential Linear Logic Marie Kerjean, Valentin Mastracci, Morgan Roger
12:10	Proof-theoretic Semantics for Intuitionistic Multiplicative Linear Logic Alexander V. Gheorghiu, Tao Gu, David J. Pym
12:35-14:00	Lunch break
14:00	TBA Zeinab Gabal / Marcelo Fiore
15:30-16:30	Coffee break
16:30	A Quantitative Understanding of Exceptions Miguel Ramos, Riccardo Treglia, Delia Kesner
16:55	On the Complexity of Normalization for the Planar λ-calculus Anupam Das, Damiano Mazza, Lê Thành Dũng Nguyễn, Noam Zeilberger
17:20	How To Play The Accordion. On the (Non-)Conservativity of the Reduction Induced by the Taylor Approximation of λ-Terms Rémy Cerda, Lionel Vaux Auclair
17:45	Multi-modalities and non-commutativity in functorial linear logic: a case study Carlos Olarte, Elaine Pimentel



Location: Room 15

10:30-12:30

Session 2

10:30-11:30

Proof Terms for Higher-Order Rewriting and Their Equivalence

Pablo Barenbaum (Invited Speaker)

11:30-12:00

Alpha-Structural Induction and Recursion for the Lambda Calculus in Constructive Type Theory using Simple Renaming

Miguel Pagano and Álvaro Tasistro

12:00-12:30

A novel EGs-based framework for propositional-formula simplification

Jordina Francès de Mas and Juliana Bowles

12:30-14:00

Lunch Break

14:00-15:30

Session 3

14:00-15:00

Mechanizing Session-Types: Enforcing linearity without linearity

Brigitte Pientka (Invited Speaker)

15:00-15:30

More Church-Rosser Proofs in Beluga

Alberto Momigliano and Martina Sassella

15:30-16:00

Coffee Break

16:00-17:30

Session 4

16:00-16:30

Formalizing Factorization on Euclidean Domains and Abstract Euclidean Algorithms

Thaynara Arielly de Lima, André Luiz Galdino, Andréia B. Avelar and Mauricio Ayala-Rincón

16:30-17:00

Embedding Differential Dynamic Logic in PVS

J. Tanner Slagel, Mariano Moscato, Lauren White, César Muñoz, Swee Balachandran and Aaron Dutle

17:00-17:30

Stalnaker's Epistemic Logic on Isabelle/HOL

Laura P. Gamboa Guzman and Kristin Yvonne Rozier



Location: Room 15

10:30-12:30

Session 2 (LSFA + LFMTTP joint sessions)

Invited Talk

10:30-11:30

Cutting a proof into bite-sized chunks (Incrementally proving termination in higher-order term rewriting)

Cynthia Kop (joint talk LSFA + LFMTTP)

10:30-11:30

LFMTTP contributed talk

11:30-12:00

Semi-Substructural Logics with Additives

Niccolò Veltri and Cheng-Syuan Wan



Location: Room 17

09:00-10:00	Session 1
09:00-10:00	Lambda-Superposition: From Theory to Trophy Jasmin Blanchette (Joint Talk FSCD + CADE)
10:00-10:30	Coffee Break
10:30-12:30	Session 2 - Chair: Sandra Kiefer
10:30-10:40	Opening and organisational topics
10:40-11:00	Rabin Games and Colourful Universal Trees Rupak Majumdar, Irmak Saglam, K. S. Thejaswini
11:00-11:20	Unboundedness problems for machines with reversal-bounded counters Pascal Baumann, Flavio D'Alessandro, Moses Ganardi, Oscar Ibarra, Ian McQuillan, Lia Schütze, Georg Zetsche
11:20-11:40	Measuring the robustness of the dynamical systems. Relating time and space to length and precision Manon Blanc and Olivier Bournez
11:40-12:30	From functional analysis to proofs and program Marie Kerjean (invited talk)
12:30-14:00	Lunch Break
14:00-15:20	Session 3 - Chair: Daniele Nantes
14:00-14:20	Ecumenical types Delia Kesner, Mariana Milicich, Luiz Carlos Pereira, Elaine Pimentel
14:20-14:40	Reactive Synthesis of Linear Temporal Logic on Finite Traces Shufang Zhu
14:40-15:00	Logical Characterization of Concurrent Bisimulation over Higher Dimensional Automata Safa Zouari
15:00-15:20	A Relevant Logic with Strong Negation Mirjana Ilic



15:20-16:00	Poster Session (40 min.) + Coffee Break (30 min.)
16:00-18:00	Session 4 - Chair: Tephilla Prince
16:00-16:50	Quantitative Weak Linearisation Sandra Alves (Invited talk)
16:50-17:10	Tales of Automated Software Verification with First-order Theorem Provers Pamina Georgiou
17:10-17:30	Presheaf Models of Human Parsing Daphne Wang and Mehrnoosh Sadrzadeh
17:30-18:00	WiL Business Meeting
18:00-open	Informal Social Event



Location: Room 33

14:00-15:30	Session 1
14:00	Welcome
14:06	Quantitative Types for Useful Reduction Pablo Barenbaum (invited talk)
15:06	Modular Termination for Second-Order Rewriting Systems and Application to Effect Handlers Makoto Hamana
15:30-16:00	Coffee Break
16:00-17:45	Session 2
16:00	Nijn/Onijn: A New Certification Engine for Higher-Order Termination Cynthia Kop, Deivid Vale and Niels van der Weide
16:24	Higher-Order LCTRSs and Their Termination Liye Guo and Cynthia Kopr
16:48	Confluence Criterion for Non Left-Linearity in a Beta/Eta-Free Reformulation of HRSs Thiago Felicissimo
17:12	A Deeper Study of $\lambda!$-Calculus Simulations Victor Arrial
17:36	The algebraic lambda-calculus is a conservative extension of the ordinary lambda-calculus Axel Kerinec and Lionel Vaux Auclair



Location: Room 15

10:30-12:30	Session 2: Proofs and automation - Chair: TBA	Invited Talk
10:30	Cutting a proof into bite-sized chunks (Incrementally proving termination in higher-order term rewriting) Cynthia Kop (Invited speaker)	
11:30	Semi-Automation of Meta-Theoretic Proofs in Beluga Johanna Schwartzentruher and Brigitte Pientka	
12:00	Substructural Logics with Additives (LSFA contributed talk) Niccolò Veltri and Cheng-Syuan Wan	
12:30-14:00	Lunch Break	
14:00-15:30	Session 3: Refinement Types - Chair: TBA	
14:00	Refinement Types from Light to Deep Verification Niki Vazou (joint with LSFA) (invited speaker)	
15:00	Readable proofs with refinement types Antoine Gaulin and Brigitte Pientka	
15:30-16:00	Coffee Break	
16:00-17:30	Session 4: Verification and interpretation - Chair: TBA	
16:00	Parallel Verification of Natural Deduction Proof Graphs James Oswald and Brandon Rozek	
16:30	An interpretation (by parametricity) of $E\text{-HA}^\omega$ inside HA^ω Félix Castro	
17:00	A Framework for the Verification of Collision Freeness for Collaborative Robots Artur Graczyk, Marialena Hadjikostand and Andrei Popescu	
17:30-18:30	Business Meeting - Chair Elaine Pimentel	



Location: Room 17

09:00-10:00	Session 1
09:00-10:00	What are abstract machines good for? Gabriele Vanoni (invited talk)
10:00-10:30	Coffee Break
10:30-12:30	Session 2
10:30-11:00	Logic Programming with Multiplicative Structures Matteo Acclavio and Roberto Maieli
11:00-11:30	Random Graph Generation in Context-Free Graph Languages Detlef Plump and Federico Vastarini
11:30-12:00	Conditional Nested Pattern Matching in Interaction Nets Shinya Sato
12:00-12:30	Developments in Sheaf-Theoretic Models of Natural Language Ambiguities Kin Ian Lo, Mehrnoosh Sadrzadeh and Shane Mansfield
12:30-14:00	Lunch Break
14:00-15:30	Session 3
14:00-15:00	Partial Typing for Open Compliance in Multiparty Sessions Mariangiola Dezani-Ciancaglini (invited talk)
15:00-15:30	When Do You Start Counting? Revisiting Counting and Pnueli Modalities in Timed Logics Hsi-Ming Ho and Khushraj Madnani (talk 5)
15:30-16:00	Coffee Break
16:00-17:00	Session 4
16:00-17:00	From Compressing Lambda-Letrec Terms to Recognizing Regular-Expression Processes Clemens Grabmayer (invited talk)



Location: Room 8

10:30-12:30	Session 1 <i>invited Talk</i>
10:30	Using Tree Automata for Verification, at last Thomas Genet
11:20	The International School on Rewriting Aart Middeldorp
11:40	Symbolic techniques for quantitative extensions of equality Temur Kutsia
12:30-14:00	Lunch Break
14:00-15:45	Session 2
14:00	Lambdapi, a proof assistant using rewriting Niki Vazou (joint with LSFA) (invited speaker)
14:50	The Rewriting Website Antoine Gaulin and Brigitte Pientka
15:15	Business Meeting



Location: Room 13

09:00-10:00	Session 1 (Invited Talk)
09:00	Formalisation of Nominal Equational Reasoning Mauricio Ayala-Rincón (Universidade de Brasília)
10:00-10:30	Coffee Break
10:30-12:30	Session 2
10:30	Modal unification step by step Sam van Gool and Johannes Martl
11:00	One-Variable Unification in K Stéphane P. Desarzens
11:30	Second-order unification and functional arity Aleksy Schubert
12:00	Generalising Huet-style Projections in E-unification for Second-Order Abstract Syntax Nikolai Kudasov
12:30-14:00	Lunch Break
14:00-15:30	Session 3
14:00	Typed Unification: when failure may not be wrong João Barbosa, Mário Florido and Vitor Santos-Costa
14:30	Inferring RPO Symbol Ordering Wei Du, Paliath Narendran and Michael Rusinowitch
15:00	Matching in Quantitative Equational Theories Georg Ehling and Temur Kutsia
15:30-16:00	Coffee Break
16:00-17:00	Session 4 (Invited Talk)
16:00	A New Perspective on Invariant Generation as Semantic Unification Deepak Kapur (UNM, Albuquerque)
17:00-18:00	Session 5
17:00	On Anti-unification in Absorption Theories Andrés Felipe González Barragán, David Cerna, Mauricio Ayala-Rincón and Temur Kutsia
17:30	The conjugacy problem and the uniform common term problem in dwindling string rewriting systems Andrew Pulver



Location: Room 13

09:00-10:00	Session 1 <i>Invited Talk</i>
09:00-09:30	A Nesting-Preserving Transformation of SIMP Programs into Logically Constrained Term Rewrite Systems Naoki Nishida, Misaki Kojima and Ayuka Matsumi
09:30-10:00	Matrix invariants for program equivalence in LCTRSs Kasper Hagens and Cynthia Kop
10:00-10:30	Coffee Break
10:30-12:30	Session 2
10:30-11:30	Hydra Battles, Termination, and Transformations Aart Middeldorp (invited talk)
11:30-12:00	Optimizing Term Rewriting with Creeper Trace Transducers Rick Erkens
12:00-12:30	On Representations of Waiting Queues for Semaphores in Logically Constrained Term Rewrite Systems Misaki Kojima and Naoki Nishida
12:30-14:00	Lunch Break
14:00-15:30	Session 3
14:00-15:00	Syntactic trinitarianism: terms, graphs, diagrams Dan Ghica (invited talk)
15:00-15:30	SpyType - Type Based Abstract Semantics for Python Andrei Nacu

Monday, July 3rd

09:00-10:00	Session 1: CADE-FSCD joint invited talk
	Invited Talk Chair: Cesare Tinelli Location: Room 33
09:00	How Can We Make Trustworthy AI? Mateja Jamnik
10:00-10:30	Coffee Break
10:30-12:30	Session 2
	Chair: Marco Gaboardi Location: Room 38
10:30	Strategies as Resource Terms, and their Categorical Semantics Lison Blondeau-Patissier, Pierre Clairambault and Lionel Vaux Auclair <u>PRESENTER: Lison Blondeau-Patissier</u>
11:00	Convolution Products on Double Categories and Categorification of Rule Algebras Nicolas Behr, Paul-André Melliès and Noam Zeilberger <u>PRESENTER: Paul-André Melliès</u>
11:30	Dinaturality meets genericity: a game semantics of bounded polymorphism <u>PRESENTER: James Laird</u>
12:00	For the Metatheory of Type Theory, Internal Scoring Is Enough Rafaël Bocquet, Ambrus Kaposi and Christian Sattler <u>PRESENTER: Rafaël Bocquet</u>

12:30-14:00	Lunch Break
14:00-15:30	Session 3
	Chair: Femke Van Raamsdonk Location: Room 38
14:00	Quotients and Extensionality in Relational Doctrines Francesco Dagnino and Fabio Pasquali <u>PRESENTER: Francesco Dagnino</u>
14:30	The Formal Theory of Monads, Univalently <u>PRESENTER: Niels van der Weide</u>
15:00	Combinatory logic and lambda calculus are equal, algebraically Thorsten Altenkirch, Ambrus Kaposi, Artjoms Sinkarovs and Tamás Végh <u>PRESENTER: Ambrus Kaposi</u>
15:30-16:00	Coffee Break
16:00-20:00	Excursion
20:00-23:00	Conference dinner

Tuesday, July 4th

09:00-10:00	Session 4: FSCD-CADE joint invited talk
	Invited Talk Chair: Femke Van Raamsdonk Location: Room 38
09:00	Nominal Techniques for Software Specification and Verification <u>PRESENTER: Maribel Fernández</u>
10:00-10:30	Coffee Break
10:30-12:30	Session 5: Linear Logic
	Chair: Daniele Nantes-Sobrinho Location: Room 38
10:30	The Sum-Product Algorithm for Quantitative Multiplicative Linear Logic Michele Pagani, Thomas Ehrhard and Claudia Faggian <u>PRESENTER: Michele Pagani</u>
11:00	Unifying Graded Linear Logic and Differential Operators Flavien Breuvert, Marie Kerjean and Simon Mirwasser <u>PRESENTER: Simon Mirwasser</u>
11:30	Type Isomorphisms for Multiplicative Additive Linear Logic Rémi Di Guardia and Olivier Laurent <u>PRESENTER: Rémi Di Guardia</u>
12:00	Concurrent Realizability on Conjunctive Structures Emmanuel Beffara, Félix Castro, Mauricio Guillermo and Étienne Miquey <u>PRESENTER: Étienne Miquey</u>
12:30-14:00	Lunch Break

14:00-15:30	Session 6
	Chair: Ambrus Kaposi Location: Room 38
14:00	Rewriting modulo traced comonoid structure Dan Ghica and George Kaye <u>PRESENTER: George Kaye</u>
14:30	Categorical coherence from term rewriting systems <u>PRESENTER: Samuel Mimram</u>
15:00	Homotopy type theory as internal languages of diagrams of ∞-logoses <u>PRESENTER: Taichi Uemura</u>
15:30-16:00	Coffee Break
16:00-18:00	Session 7
	Chair: Clemens Grabmayer Location: Room 38
16:00	Partial model checking and partial model synthesis in LTL using a tableau-based approach Serenella Cerrito, Valentin Goranko and Sophie Paillocher <u>PRESENTER: Serenella Cerrito</u>
16:30	Labelled Tableaux for Linear Time Bunched Implication Logic Didier Galmiche and Daniel Mery <u>PRESENTER: Daniel Mery</u>

Wednesday, July 5th

09:00-10:00	Session 8: FSCD invited talk
	Invited Talk Chair: Marco Gaboardi Location: Room 38
09:00	A Lambda Calculus Satellite <u>PRESENTER: Giulio Manzonetto</u>
10:00-10:30	Coffee Break
10:30-12:30	Session 9
	Chair: Aleksy Schubert Location: Room 38
10:30	α-avoidance Samuel Frontull, Georg Moser and Vincent van Oostrom <u>PRESENTER: Samuel Frontull</u>
11:00	Two Decreasing Measures for Simply Typed Lambda-Terms Pablo Barenbaum and Cristian Sottile <u>PRESENTER: Cristian Sottile</u>
11:30	A quantitative version of simple types Simona Ronchi Della Rocca and Daniele Pautasso <u>PRESENTER: Daniele Pautasso</u>
12:00	On the Lattice of Program Metrics Ugo Dal Lago, Naohiko Hoshino and Paolo Pistone <u>PRESENTER: Naohiko Hoshino</u>
12:30-14:00	Lunch Break

14:00-15:30	Session 10
	Chair: Luca Roversi Location: Room 38
14:00	Diller-Nahm bar recursion <u>PRESENTER: Valentin Blot</u>
14:30	Cyclic proofs for (arithmetical) inductive definitions Anupam Das and Lukas Melgaard <u>PRESENTER: Lukas Melgaard</u>
15:00	Representing Guardedness in Call-by-Value <u>PRESENTER: Sergey Goncharov</u>
15:30-16:00	Coffee Break
16:00-18:00	Session 11 - General Meeting FSCD
	Chair: Herman Geuvers Location: Room 38

Thursday, July 6th

09:00-10:00	Session 12: FSCD invited talk
	Invited Talk Chair: Aart Middeldorp Location: Room 38
09:00	Termination of Term Rewriting: Foundation, Formalization, Implementation, and Competition <u>PRESENTER: Akihisa Yamada</u>
10:00-10:30	Coffee Break
10:30-12:30	Session 13
	Chair: Pablo Barenbaum Location: Room 38
10:30	Generalized Newman's Lemma for Discrete and Continuous Systems <u>PRESENTER: levgen Ivanov</u>
11:00	Knowledge Problems in Security Protocols: Going Beyond Subterm-Convergent Theories Saraid Dwyer Satterfield, Serdar Erbatur, Andrew M. Marshall and Christophe Ringeissen <u>PRESENTER: Andrew M. Marshall</u>
11:30	Automata-based verification of relational properties of functions over data structures Théo Losekoot, Thomas Genet and Thomas Jensen <u>PRESENTER: Théo Losekoot</u>
12:00	Hydra Battles and AC Termination Nao Hirokawa and Aart Middeldorp <u>PRESENTER: Nao Hirokawa</u>
12:30-14:00	Lunch Break

14:00-15:30	Session 14
	Chair: Femke Van Raamsdonk Location: Room 38
14:00	Cost-Size Semantics for Call-by-Value Higher-Order Rewriting Deivid Vale and Cynthia Kop <u>PRESENTER: Deivid Vale</u>
14:30	E-unification for Second-Order Abstract Syntax <u>PRESENTER: Nikolai Kudasov</u>
15:00	The logical essence of compiling with continuations José Espírito Santo and Filipa Mendes <u>PRESENTER: José Espírito Santo</u>
15:30-16:00	Closing Coffee Break

● Welcome Reception

Date: **2 JULY 2023**
Time: **18:30 - 20:00**
Where: **Venue**

The Welcome Reception is the first social gathering between all conference delegates and it will take place at the Venue. It will be a relaxing evening during which delegates will have the opportunity to talk to colleagues and peers, while enjoying local drinks and ample canapés.

The welcome reception is included in all Physical (except Workshop only) Registration fees registration fees.

Additional tickets for accompanying persons & Workshop only registrations can be purchased through the registration system or onsite.

Cost for extra Welcome Reception ticket: **€40.00**



● Excursion and Conference Dinner

Date: **3 JULY 2023**
Time: **20:00-23:00**
Departure From: **Venue**

We will depart from the venue in air conditioned busses with licensed tour guides for an excursion to the historical sites of Rome. The excursion will be a combination of driving and walking tour. We will end the day with the Conference Dinner, which will be at a local restaurant. At the end of the evening, the buses will be available for return (stop at the venue area).

Restaurant location: Ristorante Da Meo Patacca

Address: Piazza dei Mercanti, 30, 00153 Roma RM, Italy

The Conference Dinner is not included in the Online, Workshop Only & Student registration fees;

Tickets can be purchased through the registration system or onsite.

Cost for Conference dinner ticket: **€80.00**



View on Map:



ROME



ROME

ROME



Interesting Facts

Modern Rome has 280 fountains and more than 900 churches.

Nearly 700,000 euros worth of coins are tossed into Rome's Trevi Fountain each year. The proceeds are donated to Caritas to help those in need.

The Romans had built a road network of 53,000 miles by the early fourth century. Each Roman mile was about 4,800 feet and marked by a milestone, giving birth to the saying "All roads lead to Rome."

The mascot of Rome is a she-wolf that cared for brothers Romulus and Remus, the mythological founders of Rome. Rome became the capital city of unified Italy in 1870, taking the title from Florence.



The first ever shopping mall was built in Rome between 107 and 110 AD by Emperor Trajan. It sold a wide variety of goods and grocery items. Rome's first university, La Sapienza, established in 1303 AD, is the largest in Europe and the second largest in the world.

Rome has a museum dedicated entirely to pasta. St Peter's basilica inside Vatican City is the largest church ever constructed.

Rome, Italian Roma, the historic city and capital of Roma province, of Lazio region, and of the country of Italy. Rome is located in the central portion of the Italian peninsula, on the Tiber River about 15 miles inland from the Tyrrhenian Sea.

ROME



The province of Rome is a matching frame for the many treasures of the capital, and the surrounding area has, more or less directly, experienced the influence of the history of the Eternal City.

A region with a great deal to offer: sea, nature, good food and villages rich in history and art. The sea, the hills, lakes, rivers and vineyards: the surroundings of Rome offer a kaleidoscope of diversity and attractions for nature lovers.





SAPIENZA

UNIVERSITÀ DI ROMA

Sapienza University of Rome, founded in 1303 by Pope Boniface VIII, is one of the oldest universities in the world and a high performer among the largest universities in international rankings. Since its founding over 700 years ago, Sapienza has played an important role in Italian history and has been directly involved in key changes and developments in society, economics and politics. It has contributed to the development of Italian and European science and culture in all areas of knowledge.

The Faculty of Civil and Industrial Engineering has a long tradition of teaching and researching. It has also an international reputation for excellence and strong relations with industrial partners. The Faculty is located in the historic centre of Rome, directly overlooking the Coliseum and next to the ancient Basilica of San Pietro in Vincoli, home to Michelangelo's statue of Moses.



The Faculty of Civil and Industrial Engineering is located in the area of St. Peter in Chains.

Faculty Address

Via Eudossiana, 18, Sapienza University of Rome
00184, Roma, Italy

How to reach

The Department is located in the building B (from the first to the fourth floor) inside the XVth century complex of the Engineering Faculty in via Eudossiana, 18.

On foot

From Colosseum, take the escalators inside Metro B station in Via dei Fori Imperiali and once you are on the top, please have first the great and impressive panoramic view of Colosseum, Costantino Arch, Palatino hill and Fori Imperiali, then turn back and take via della Polveriera and from Largo della Polveriera, make a left and you are on via Eudossiana.

From via Cavour, take either the stairs in front of Palatino Hotel which bring you in front of S. Pietro in Vincoli Basilica, or from Metro B station via Cavour take the stairs of via Monte Polacco once on the top either make a right towards S. Pietro in Vincoli or walk on your left side to via delle Sette Sale and enter the back entrance of the Faculty.

By car

This is not the best way but if you cannot avoid it here are some routes depending where you come from.

From Piazza Vittorio, cross Largo Brancaccio, straight on enter via Lanza, take the first street on the left, via Equizia, at the end make a right and you are on via del Colle Oppio, park where you can. If you park inside the blue lines, please make sure you pay the parking fare in advance (use the machines on the sidewalk or purchase the tickets in advance at newsstands or tobacco shops).

From Piazza Venezia, take via dei Fori Imperiali and then make a left on via Cavour and drive to via Lanza. Find via Equizia on the right side then continue as above.

By public transportation

By bus: lines 81, 85, 87, 11 and 27 stop at Colosseum.

By tram: line 30 stops at Colosseum.

By metro: you can exit at either Colosseum or via Cavour stations of blue line B and follow the indications above.

From the International Airport “Leonardo da Vinci”

By taxi: fare 40 Euros, it takes about 50 minutes up to 90 minutes in heavy traffic conditions.

By train: the easiest way is to take Leonardo Express direct train to Termini Station. From there you can walk to via Cavour (it takes about 15 minutes) or take a taxi or Metro B (one stop to via Cavour). As an alternative you can take a local train to Ostiense Station and take Metro B. For information on timetables and fares visit www.trenitalia.com.

From Ciampino Airport

By private transportation, book a shuttle bus (there are several companies) or take a taxi (same fare from da Vinci Airport). By public transportation, take a bus to Anagnina red line Metro A station, then go to Termini station. Visit the Ciampino Airport website for further details at www.adr.it.

How to reach the centre from the airport

Please visit the websites below to get helpful information on how to reach the centre of Rome from the “Leonardo da Vinci” Fiumicino Airport: <https://www.rome-airport.info/in.html>

Please visit the website below to get helpful information on how to reach the centre of Rome from the Ciampino Airport: Aeroporti di Roma



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📍 P.O.Box 24420, 1704, Nicosia, Cyprus
☎ +357 22 591900
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