The 29th International Conference on Developments in Language Theory

DLT2025 SEOUL

AUGUST 19 - 22

LOCATION

Room 307,
Centennial Memorial Hall,
University of Seoul

DATE

August 19 - 22 2025

SPONSORS

NRF National Research Foundation of Korea

서울시립대학교 UNIVERSITY OF SEOUL SW중심대학사업단

Data Science PLUS 데이터사이언스 플러스

UNIVERSITY OF SEOUL

PROGRAM

DLT 2025 SEOUL AUGUST 19 - 22

DAY 1 (TUESDAY, AUGUST 19TH)

Time	Session	Remarks
08:00–08:45	Registration and Coffee	
08:45–09:00	Opening Remarks	
09:00–10:30	Contributed Session 1 - 1 On the transformation of two-way nondeterministic finite automata to unambiguous finite automata	Semyon Petrov and Alexander Okhotin
	Contributed Session 1 - 2 Nondeterminism Makes Unary 1-Limited Automata Concise	Bruno Guillon, Luca Prigioniero and Javad Taheri
	Contributed Session 1 - 3 Improved Upper Bounds for Determinizing NIDPDAs with Limited Nondeterminism	Mohammad Zakzok and Kai Salomaa
10:30–11:00	Coffee Break	
11:00–12:15	Invited Talk 1 Robust Model Checking for Signal Temporal Logic	Kyungmin Bae
12:15–13:30	Lunch	Irum Lounge, 4th Floor, Centennial Memorial Hall
13:30–15:00	Contributed Session 2 - 1 Turn Complexity of Context-free Languages, Pushdown and One-Counter Automata	Giovanni Pighizzini
	Contributed Session 2 - 2 Left Quotients of Deterministic Context-Free Languages	Brennan Lockinger and Ian McQuillan
	Contributed Session 2 - 3 Checking whether two unambiguous grammars describe the same set of strings of length n	Vladislav Makarov
15:00–15:30	Coffee Break	
15:30–16:30	Invited Tutorial 1 Subword Tokenization Meets Formal Language Theory	Marco Cognetta
16:30–17:00	Coffee Break	

DAY 1 (TUESDAY, AUGUST 19TH)

Time	Session	Remarks
17:00–18:00	Informal Presentation - 1 Sparsity of M-unambiguous Languages	Joonghyuk Hahn, Yusuke Inoue, Ingyu Baek and Yo-Sub Han
	Informal Presentation - 2 An approach of example partitioning for practical regular expression synthesis	Hyunjoon Cheon and Seongmin Kim
	Informal Presentation - 3 Three Open Problems related to Context-Free Languages	Ryoma Sin'ya
18:00–20:00	Welcome Reception	Room 206, 21st Century Building

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DAY 2 (WEDNESDAY, AUGUST 20TH)

Time	Session	Remarks
09:00–10:30	Contributed Session 3 - 1 Deciding Sparseness of Regular Languages of Finite Trees and Infinite Words	Kord Eickmeyer and Georg Schindling
	Contributed Session 3 - 2 Subregular Expressions with Two Operations	Martin Kutrib, Priscilla Raucci and Matthias Wendlandt
	Contributed Session 3 - 3 Heuristic universality detection over regular expressions specified by systems	Florent Koechlin, Carine Pivoteau and Pablo Rotondo
10:30–11:00	Coffee Break	
11:00–12:15	Invited Talk 2 Recent Developments on the CDAWGs - Algorithms and Combinatorics	Shunsuke Inenaga
12:15–13:30	Lunch	Irum Lounge, 4th Floor, Centennial Memorial Hall
13:30–14:15	Invited Talk 3 Arto Salomaa - Pioneer of Formal Languages and Automata Theory	Jarkko Kari
14:15-14:45	Coffee Break	
14:45-15:00	Salomaa Prize Award Ceremony	
15:00–16:00	Invited Talk by Salomaa Prize Winner Unboundedness problems for formal languages	Georg Zetzsche
16:00–16:30	Coffee Break	
16:30–18:00	Contributed Session 4 - 1 Universally Wheeler Languages	Ruben Becker, Giuseppa Castiglione, Giovanna D'Agostino, Alberto Policriti, Nicola Prezza, Antonio Restivo and Brian Riccardi
	Contributed Session 4 - 2 Mapped Exponent and Asymptotic Critical Exponent of Words	Eva Foster, Aleksi Saarela and Aleksi Vanhatalo
	Contributed Session 4 - 3 Jumbled Scattered Factors	Pamela Fleischmann, Annika Huch, Melf Kammholz and Tore Koß
18:00–20:00	Social Event	Outdoor Area

DAY 3 (THURSDAY, AUGUST 21ST)

Time	Session	Remarks
08:30–10:00	Contributed Session 5 - 1 Sorting Circular Suffixes in Linear Time	Nicola Cotumaccio
	Contributed Session 5 - 2 A General Information Extraction Framework Based on Formal Languages	Markus Schmid
	Contributed Session 5 - 3 Pattern mining under Simon's congruence	Sungmin Kim and Yo-Sub Han
10:00–10:30	Coffee Break	
10:30–11:45	Invited Talk 4 Partial Cubes and Fibonacci Dimension - Insights and Perspectives	Dora Giammarresi
11:45–12:15	Lunch	Lunchbox
12:15-18:30	Excursion: DMZ Peace Tour	**Identity document required (e.g., passport)**
18:30-21:00	Banquet	Room 206, 21st Century Building

DAY 4 (FRIDAY, AUGUST 22ND)

Time	Session	Remarks
09:00–10:30	Contributed Session 6 - 1 A Comparative Analysis of Deletion Closure Operations and Their Properties	Da-Jung Cho and Tikhon Pshenitsyn
	Contributed Session 6 - 2 Relativized Codes, Finite Decodability, and Bounded Languages	Oscar Ibarra and Ian McQuillan
	Contributed Session 6 - 3 Positive Varieties of Lattice Languages	Yusuke Inoue and Yuji Komatsu
10:30–11:00	Coffee Break	
11:00–12:15	Invited Talk 5 Formal Languages and Arithmetic Theories - Recent Results and Open Problems	Christoph Haase
12:15-12:30	Closing Remarks	

ABSTRACT

Robust Model Checking for Signal Temporal Logic

Kyungmin Bae (POSTECH, South Korea)

Signal Temporal Logic (STL) is a temporal logic for specifying linear-time properties of continuous signals. It is widely used in monitoring and testing hybrid systems that exhibit both discrete and continuous behavior. However, model checking for such systems has mostly focused on invariants and reachability, due to the difficulty of handling uncountably many continuously evolving signals. In this talk, I introduce a bounded model checking approach for general STL properties of hybrid systems. Our method is built on a novel logical foundation for STL, including: (i) syntactic separation, which decomposes STL formulas into parts that depend exclusively on separate signal segments; (ii) signal discretization, which abstracts continuous signals into discrete elements; and (iii) epsilon-strengthening, which reduces robust STL checking to Boolean STL checking. This foundation allows STL model checking—up to given bounds and robustness thresholds—to be reduced to the satisfiability of a first-order formula, which is decidable if the reachability of the underlying hybrid system is decidable.

Subword Tokenization Meets Formal Language Theory

Marco Cognetta (Tokyo Institute of Technology, Japan)

Tokenization is the first stage of the modern neural language modeling pipeline where raw text strings are converted to subword tokens that can be consumed by a language model. Popular tokenization algorithms like Byte-Pair Encoding or MaxMatch are rooted in compression algorithms and have ad-hoc implementations with many subtle differences in the details. Recent works have discovered connections between formal language theory (in particular, the use of finite-state transducers) and tokenization. We will discuss subword tokenization, a unifying finite-state transduction framework for popular tokenization algorithms, the use of subword-based automata in important downstream tasks such as constrained generation, and some open problems and challenges that still exist in the field.

Recent Developments on the CDAWGs – Algorithms and Combinatorics

Shunsuke Inenaga (Kyushu University, Japan)

The compact directed acyclic word graph (CDAWG) of a string T, denoted $(CDAWG(T))$, is the smallest edge-labeled DAG that is obtained by merging isomorphic subtrees of the suffix tree of T. CDAWGs are a fundamental string data structure with applications in text pattern searching, data compression, and pattern discovery. For instance, $(CDAWG(T))$ allows for matching patterns and computing maximal exact matches (MEMs) in optimal $O(m)$ time with $O(e(T))$ space, where m is the pattern length and $e(T)$ is the number of edges in $(CDAWG(T))$. It is known that there is a one-to-one correspondence between the internal nodes of $(CDAWG(T))$ and the maximal repeats in T, and that there is a one-to-one correspondence between the edges of $(CDAWG(T))$ and the right-extensions of the maximal repeats in T. Hence, e tends to be small when the string contains a small number of distinct maximal repeats (and their right extensions). In the best case, e can be $O(\log n)$ for some highly repetitive strings of length n, including the Fibonacci words and Thue-Morse words. In this talk, after revisiting the basic notions and properties, we review some of the recent developments on CDAWGs in both algorithms and combinatorics perspectives.

Arto Salomaa – Pioneer of Formal Languages and Automata Theory

Jarkko Kari (University of Turku, Finland)

This presentation explores the life and scholarly contributions of Arto Salomaa (1934-2025), a Finnish mathematician whose work has shaped the field of theoretical computer science. Renowned for his research on formal languages and automata theory, Salomaa authored hundreds of influential papers over seven decades. His classic books on Automata theory, Formal Languages, L-systems, etc. have become standard references worldwide. Beyond his scientific achievements, the presentation will highlight Salomaa's role as an educator and organizer, notably at the University of Turku, where he fostered a vibrant community of theoretical computer science research. This talk recalls milestones of Salomaa's career, expressing appreciation of his lasting impact on the development of language theory.

Unboundedness Problems for Formal Languages

Georg Zetzsche (Max Planck Institute for Software Systems, Germany)

Informally, unboundedness problems are decision problems that ask about the existence of infinitely many words (satisfying certain properties) in a formal language. One example is: Is a given language infinite? Or: Does a given language have super-polynomial growth? These came into focus in recent years because of their connections to downward closure computation and separability problems. Although unboundedness problems may seem difficult at first, it turns out that there are techniques that are at the same time conceptually very simple, but also apply to a surprisingly wide variety of language classes. The talk will survey recent results (and techniques) concerning unboundedness problems.

Partial Cubes and Fibonacci Dimension – Insights and Perspectives

Dora Giammarresi (University of Rome Tor Vergata, Italy)

A partial cube is a graph G that embeds isometrically into a hypercube Q_k, with minimum such k called the isometric dimension $\mathrm{idim}(G)$ of G. A Fibonacci cube Γ_k excludes from the vertices strings containing "11", and any partial cube G embeds into some Γ_d, defining the Fibonacci dimension $\mathrm{fdim}(G)$ as the minimum such d. It holds that $\mathrm{idim}(G) \leq \mathrm{fdim}(G) \leq 2 \cdot \mathrm{idim}(G) - 1$. While $\mathrm{idim}(G)$ is computable in polynomial time, checking whether $\mathrm{idim}(G) = \mathrm{fdim}(G)$ is NP-complete. We survey properties of partial cubes and generalized Fibonacci cubes, and present a new family of graphs G for which $\mathrm{idim}(G) = \mathrm{fdim}(G)$. We conclude with some open problems.

Formal Languages and Arithmetic Theories: Recent Results and Open Problems

Christoph Haase (University of Oxford, UK)

In this talk, I am going to survey recent developments at the intersection of formal language theory and logical theories of arithmetic, focusing particularly on Büchi and Semënov arithmetic. I will explore the connections between sets of integers defined by logical formulas and their representation as formal languages, and present some key results concerning the expressive power and algorithmic properties of these arithmetic theories. I will also outline several open problems that arise from the current body of literature.

INFO.

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CONFERENCE INFORMATIONS

Wi-Fi Access

Name: DLT2025-1 (or DLT2025-2)
Password: DLT2025@Seoul!

Meals

Lunch will be provided in the Cafeteria (Irum Lounge, 4th Floor, Centennial Memorial Hall).

Facilities

Restroom is located in front of the Room 307.

Contact for Inquiries

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Official Homepage

https://cida.uos.ac.kr/dlt2025/

Venue

Room 307, 3rd Floor, The Centennial Memorial Hall (100주년기념관)

Welcome Reception & Banquet

Room 206, 2nd Floor, The 21th Century Building (21세기관)

TRIP KOREA

Travel Guide

https://english.visitkorea.or.kr/

Food

Samgyeopsal
- Korean-style bacon

Bibimbap
- Rice topped with vegetables, egg, beef

Dessert **Bingsu**
- Shaved ice with red bean

Korean Seasoned Chicken
- Chicken with a sweet and spicy sauce

Where to Go in Seoul

Gyeongbokgung Palace

N Seoul Tower

National Museum of Korea

Hangang Park

Bukchon Hanok Village

National Museum of Modern and Contemporary Art, Seoul

Jogyesa Temple

Myeongdong

Naksan Park