Tag: Dienstag

Zeit: 9^{00}—10^{00}

Name: Sebastian Bader

Titel: tba

Abstract: tba

Tag: Freitag

Zeit: 9^{00}—10^{00}

Name: Björn Borchardt

Titel: Bounds for Tree Automata with Polynomial Costs - Part I

Abstract: This talk is intended to provide the theoretic background for the results on bounds of tree automata with polynomial costs, which are presented in the second talk. We mainly investigate three topics. First we recall some notions on trees and on tree substitution. Second we establish a theory of monomials and polynomials over non-commutative semirings. In particular we define the concepts of relevant variables, the semantic degree, and the syntactic degree and prove relationships between these concepts. Third we introduce the class of monotonic semirings, which are partially ordered semirings of the form $\mathcal{A} = (A, \oplus, \odot, \mathbf{0}, \mathbf{1}, \preceq)$, having an infinite carrier set A, and satisfying

(i) $a_1 \preceq a_1 \oplus a_2$ for every two semiring elements $a_1, a_2 \in A$ and

(ii) $a_1 \prec a_1 \odot a_2$ and $a_1 \prec a_2 \odot a_1$ for every two semiring elements $a_1 \in A \setminus \{\mathbf{0}\}$ and $a_2 \in A \setminus \{\mathbf{0}, \mathbf{1}\}$.

We derive some properties of monotonic semirings as well as decidabilty results, e.g., does a polynomial over a monotonic semiring induce a constant or a linear polynomial function.

The paper presented in this talk is a joint work of Zoltán Fülöp, Zsolt Gazdag (both: University of Szeged, Hungary), Andreas Maletti and myself (both: University of Technology, Dresden).

Tag: Montag

Zeit: 16^{45}—17^{45}

Name: Frank Felfe

Titel: tba

Abstract: tba

Tag: Mittwoch

Zeit: 9^{00}—10^{00}

Name: Bernhard Ganter

Titel: tba

Abstract: tba

Tag: Dienstag

Zeit: 16^{45}—17^{45}

Name: Claus Jürgensen

Titel: "Discrete Event Systems" und Spektraltheorie von Max-Plus-Algebren

Abstract: Straßen-, Schiffs- und insbesondere Schienenverkehr kann besonders gut mit Methoden aus der Theorie der Discrete Event Systems (DES) beschrieben und simuliert werden. Zu den etablierten Methoden zur Analyse und Optimierung von DES zählt die Theorie der Max-Plus-Algebren, die insbesondere für zyklische Prozesse (z. B. Verkehr im U-Bahn-Netz) geeignet ist. Die Spektraltheorie der Max-Plus-Algebren (oder allgemeiner der Dioiden) kann zur Beschreibung des asymptotischen Verhaltens von DES verwendet werden (z. B. zur Bestimmung optimaler U-Bahn Taktzeiten).

Tag: Donnerstag

Zeit: 9^{00}—10^{00}

Name: Dietrich Kuske

Titel: Supplementing words and trees with numerical predicates

Abstract: Let T_Σ be the complete binary tree and let el be the binary predicate on T_Σ stating that two nodes live at the same level. Elgot & Rabin showed that the first-order theory of this structure is decidable while the monadic second order theory is undecidable. For a function $f : \mathbb{N} \to \mathbb{N}$, they then define a binary predicate F on T_Σ stating that u lives at level $f(n)$ where n is the level of v (for f the identity function, F is the predicate el above). It turns out that under quite mild assumptions on f, the theory of (T_Σ, F) becomes undecidable (e.g., if $f = 2n$ or $f(n) =$ maximal prime that divides n). I will show that the existential theory of (T_Σ, F) is decidable iff the existential theory of $(\mathbb{N}, \leq, f)$ is decidable. Secondly, I will present a new proof of Elgot & Rabin's result that shows undecidability for (1) even more functions f and (2) smaller fragments of the first-order theory.

(joint work with Markus Lohrey)

Tag: Mittwoch

Zeit: 10^{30}—11^{30}

Name: Leonard Kwuida

Titel: Boolean concept algebras

Abstract: Concept algebras are contextual generalization of Boolean algebras. They can be abstracted, at least for the finite distributrive case, by weakly dicomplemented lattices. How far are weakly dicomplemented lattices from Boolean algebras?

Tag: Freitag

Zeit: 10^{30}—11^{30}

Name: Andreas Maletti

Titel: Bounds for Tree Automata with Polynomial Costs - Part II

Abstract: After having introduced a notion of polynomials in Part I of this talk, we will discuss boundedness of the costs of a tree automaton with cost function according to [Sei94] in this part. A tree automaton with cost function is a classical tree automaton $M = (Q, \Sigma, \delta, F)$ together with a mapping $c : \delta \longrightarrow A\langle X\rangle$ associating to every transition of M a cost polynomial. Therein a variable x_i refers to the cost of the i-th subcomputation. An element $a \in A$ is in the set of accepting costs, if there exists a successful computation tree of M having cost a. In [Sei94] a characterization of the boundedness of the set of accepting costs was presented for the semiring of non-negative integers, the arctic semiring, and the tropical semiring.

In this part of the talk we try to generalize these results to monotonic and finitely factorizing semirings, which have been introduced in the previous part of this talk. In order to achieve this, we first show that for naturally ordered semirings the boundedness problem is equivalent to the finiteness problem, i.e., the problem to determine whether the set of accepting costs is finite. Then we show how to solve the finiteness problem in monotonic and finitely factorizing semirings. Actually, we will prove that finiteness is effectively decidable for every tree automaton with cost function over such semirings. Thereby, we obtain decidability of the boundedness problem for naturally ordered, monotonic, and finitely factorizing semirings. Examples of such semirings are the semiring of non-negative integers and the arctic semiring already considered in [Sei94], but also the finite subset semiring over the non-negative integers (with union and addition) and the non-commutative semiring of finite languages.

The paper presented in this talk is a joint work of Zoltán Fülöp, Zsolt Gazdag (both: University of Szeged, Hungary), Björn Borchardt and myself (both: University of Technology, Dresden).

References:

[Sei94] Helmut Seidl. Finite tree automata with cost functions. Theoretical Computer Science, 126(1):113-142, 1994

Tag: Montag

Zeit: 14^{00}—15^{00}

Name: Ingmar Meinecke

Titel: Parallelism and costs

Abstract: We provide a basic theory of parallel systems with costs in the setting of *series-parallel posets.* The systems considered are build by nondeterministic choice, sequential composition and iteration, and, moreover, a parallel composition. Costs are incorporated in these systems by introducing the concept of a *bisemiring.* This concept allows to distinguish qualitatively between the ways of calculation of sequential as opposed to parallel compositions.

We define the notions of regularity and rationality in this setting, and characterize the behavior of *weighted branching automata* in the spirit of Kleene?s and Schützenberger's result. Moreover, we examine the sequential Hadamard product and explore the connections between languages of series-parallel posets and series-parallel series over a bisemiring.

Tag: Donnerstag

Zeit: 14^{00}—15^{00}

Name: Christian Pech

Titel: On a construction on q-weighted automata

Abstract: We present a construction on q-weighted automata, that allows to determinize a big class of them. Moreover we show that q-Müller-recognizable formal power-series over the max-plus semiring are not closed with respect to max. Using our construction we show that the maximum of two q-Müller-recognizable series with equal support is recognizable.

(joint work with Alexandre Scalziti)

Tag: Dienstag

Zeit: 15^{30}—16^{30}

Name: Reinhard Pöschel

Titel: tba

Abstract: tba

Tag: Donnerstag

Zeit: 10^{30}—11^{30}

Name: Ulrike Püschmann

Titel: tba

Abstract: tba

Tag: Donnerstag

Zeit: 15^{30}—16^{30}

Name: Alexandre Scalziti

Titel: tba

Abstract: tba

Tag: Donnerstag

Zeit: 16^{45}—17^{45}

Name: Baris Sertkaya

Titel: Using Formal Concept Analysis for Description Logics Concept Hierarchies

Abstract: Given a finite set of description logic concepts, we are interested in computing the subsumption hierarchy of all least common subsumers of subsets and the hierarchy of all conjunctions of subsets of this set. These hierarchies can be used to suppport the bottom-up construction of desctiption logic knowledge bases. The point is to compute the first hierarchy without having to compute the least common subsumer of for all subsets, and the second hierarchy without having to check all possible pairs of such conjunctions explicitly for subsumption. We will show that methods from formal concept analysis developed for computing concept lattices can be employed for this purpose.

Tag: Dienstag

Zeit: 10^{30}—11^{30}

Name: Olga Skvortsova

Titel: Probabilistic PDDL - Fluent Calculus Translations

Abstract: PDDL - the Planning Domain Definition Language - is a unified language for specifying deterministic planning domains and problems that was accepted by the international planning community. Younes and Littman have recently extended PDDL by the probabilistic and decision-theoretic features in order to enable the specification of uncertain domains and problems. The resulting language was called Probabilistic PDDL (PPDDL).

In our previous work, we have designed a planner based on the First-Order Value Iteration Algorithm (FOVIA) that provides an optimal plan in the uncertain environments by employing the maximum expected utility criterion. FOVIA algorithm is a Fluent Calculus counterpart of the classical Value Iteration Algorithm.

Most existing benchmark problems tailored at the decision-theoretic environments require the PPDDL representation. Therefore in order to compare the computational behaviour of the FOVIA-based planner with other state-of-the-art decision-theoretic planners, our planner should comply with the PPDDL standards.

In this talk, we will report on the initial investigations towards the translations of several PPDDL constructs into the Fluent Calculus.

Tag: Montag

Zeit: 15^{30}—16^{30}

Name: Konstantin Tchekine

Titel: C5: Compositional Coinductive Calculus of Component Connectors

Abstract: Main Goal is to create syntax and coalgebraic semantics of Compositional Coinductive Calculus of Component Connectors (C5) as a basis for the future development of visual tools or C5- programming environments for constructing objects (connectors), object (connector) systems, specification and proof of their properties. Object (connector) in C5 is modeled by greatest invariant of (arbitrary) main object (connector) property, i.e. as final sub-coalgebra on Timed Data Streams. Timed Data Stream (TDS for short) is an infinite sequence (stream) of pair of elements: data element and time element, which is state the time of data element appearance. TDS can be considered as pair of Data Stream and Time Stream as well. Object (connector) systems or more complex objects (connectors) are constructed out of simpler ones by object (connector) composition. Models (i.e. greatest invariants) for these systems or more complex objects (connectors) can be obtained out of greatest invariants of composed objects (connectors). Therefore, coinduction, which is main reasoning principle in C5, can be applied to the systems or more complex objects (connectors) as well, as to simple objects (connectors).

Tag: Montag

Zeit: 10^{30}—11^{30}

Name: Heiko Vogler

Titel: Das algebraische Pfadproblem und die Verbindung zu gewichteten Automaten

Abstract: tba

Tag: Dienstag

Zeit: 14^{00}—15^{00}

Name: Jin Yi

Titel: Belief Change for Cognitive Agents

Abstract: Action formalisms like the fluent calculus have been developed to endow logic-based agents with the ability of reasoning about the effects of actions, executing high-level strategies, and planning. In this talk, I will highlight a fundamental problem much of the action formalisms are facing. Then I will show how another field of research in knowledge representation. i.e. "belief change", can help to solve the problem. Due to the time limit, I will focus on the theory of belief change. Hence, the talk also can be considered as a gentle introduction to belief change. However, I will briefly present the results we have achieved, and discuss the future work we intend to do.
