ENTRY COMPUTABILITY

[ENTRY COMPUTABILITY] Authors: Oliver Knill: nothing real yet Literature: not yet, some lectures of E.Engeler on computation theory

Church's theses

The generally accepted [Church's theses] tells that everything which is computable can be computed using a Turing machine. In that case, the problem to determine, whether a Turing machine will halt, is not computable.

cipher

A [cipher] is a secret mode of writing, often the result of subsituting numbers of letters and then carrying out arithmetic operations on the numbers.

Coding theory

[Coding theory] is the theory of encryption of messages employed for security during the transmission of data or the recovery of information from corrupted data.

Cooks hypothesis

[Cooks hypothesis] $P = NP$. A proof or disproof is one of the millenium problems.

Graph isomorphism problem

[Graph isomorphism problem] It is not known whether graph isomorphism can be decided in deterministic polynomial time. It is an open problem in computational complexity theory.

Inductive structure

[Inductive structure] A set U with a subset A and operations $g_1, ..., g_n$ define an inductive structure $(U, A, g_1, ..., g_n)$ If all elements of U can be generated by repeated applications of the operations g_i on elements of A. Examples:

- $(N, A = \{0, 1\}, g_1(a, b) = a + b, g_2(a, b) = a * b$ defines an inductive structure.

- If $U = N$ is the set of natural numbers, $A = \{1, 2, 3\}$ $g_1(x, y) = 3x - 4, g_2(x, y, z) = 7x + 5y - z$, then (U, A, g_1, g_2) define an inductive structure.

syntactic structure

An inductive structure $(U, A, g_1, ..., g_n)$ is called a [syntactic structure] if it is uniquely readable that is if $g_1(u_1, ..., u_k) = g_2(v_1, ..., v_l)$, then $g_1 = g_2, k = l$ and $u_1 = v_1, ..., u_k = v_k$. Example: if X is the set of finite words in the alphabet $\{p, q, r, K, N\}$ and $A = \{p, q, r\}$. Define $g_1(x, y) = Kxy$ and $g_2(x, y) = Nx$ and U the set of words generated from A. The structure is the language of elementary logic in polnic notation. It is a syntactic structure. Syntactic structures are in general described by grammers.

grammar

A [grammar] (N, T, G) is given by two sets of symbols N, T and a finite set G of pairs (n_i, t_i) which define transitions $n_i \to t_i$. For example: $N = \{S\}, T = \{K, N, p, q, r\}, G = \{S \to p, S \to q, S \to r, S \to KSS, S \to NS\}$. Acoording to Chomsky, one classifies grammers with additional conditions like context sensitivity or regularity.

context sensitive

A grammer (N, T, G) is called [context sensitive] if $(n, t) \in G$ then $|t| \geq |n|$.

context sensitive

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