

Pozvánka na přednášky

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Hierarchical classifier with overlapping clusters

čtvrtek 8. dubna 2010, 14:00 – 15:00, posluchárna S11

Abstract: A classification problem can be defined as follows: Let D be an infinite set of objects characterized by a set of attributes. Each element of D belongs to exactly one of K possible classes. For a given (representative) set $X \subseteq D$ of examples construct a function $f: D \rightarrow \{1, \dots, K\}$ which assigns classes to examples in the best possible way. There are many models for solving the classification problem: neural networks, clustering methods, SVM, tree classifiers, AdaBoost etc. In my talk I would like to present a new model, so-called hierarchical classifier with overlapping clusters (HC). In this model, as in other boosting methods, we assume that the classifier consists of single classifiers which are weak, that is, they work only slightly better than a random classifier. But by combining them together, the error rate decreases. I will show both theoretical and practical results for HC. Particularly I will show a new definition of weakness and its consequences for the HC theory. Finally, I will describe the ideas for a future work on HC.

Synchronization, Černý Conjecture and the Road Coloring Problem

pondělí 12. dubna 2010, 9:00 – 10:00, posluchárna S1

Abstract: Let $\mathcal{A} = (Q, A, \delta)$ be a deterministic, complete finite automaton. We say that a word $w \in A^*$ synchronizes \mathcal{A} if $\exists p \in Q: \forall q \in Q \delta(q, w) = p$. The famous Cerny Conjecture claims that the shortest synchronizing word for an n -state synchronizing automaton has length not exceeding $(n-1)^2$. The conjecture was shown to be true for some classes of automata, but in general it is an open problem since 1964. Currently, the best known upper bound in the general case is $(n^3 - n) / 6$. In my talk I would like to present a state of the art in the field of synchronizing theory and present my results in this field. I also want to show some new ideas, which can shed some light on the problem and point out where are the difficulties in solving the Cerny Conjecture.

Short Bio

Adam Roman, born 1980, graduated from Jagiellonian University in 2003 (computer science) and obtained a PhD in computer science in 2006. He works in the Division of Discrete Mathematics in the Institute of Computer Science, Jagiellonian University. His main research interests are automata theory, artificial intelligence, machine learning and software testing.