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### Title

Packet Classification Using Multidimensional Cutting

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# Packet Classification Using Multidimensional Cutting

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## Abstract

This paper introduces a classification algorithm called *HyperCuts*. Like the previously best known algorithm, HiCuts, HyperCuts is based on a decision tree structure. Unlike HiCuts, however, in which each node in the decision tree represents a hyperplane, each node in the HyperCuts decision tree represents a  $k$ -dimensional hypercube, where  $k > 1$ . Using this extra degree of freedom and a new set of heuristics to find optimal hypercubes for a given amount of storage, HyperCuts can provide an order of magnitude improvement over existing classification algorithms. It uses 2 to 10 times less memory than HiCuts optimized for memory, while the worst case search time of HyperCuts is 50 – 500% better than that of HiCuts optimized for speed. Compared with another scheme recently introduced in Infocom 2003 called EGT-PC, HyperCuts uses 1.8 – 7 times less memory space while the worst case search time is up to 5 times smaller. More importantly, unlike EGT-PC, HyperCuts can be fully pipelined to provide one classification result every memory access time, and has fast updates.

**Please contact the authors for the full version of the paper**