

# Original Rota's basis conjecture for sparse paving matroids

Wojciech Lubawski

Theoretical Computer Science Department, UJ Kraków

[w.lubawski@gmail.com](mailto:w.lubawski@gmail.com)

In 1989 Gian-Carlo Rota stated the following conjecture:

*Suppose  $B_1, \dots, B_n$  are (not necessarily disjoint) bases of a matroid  $M$  of rank  $n$ . Then it is possible to place elements of these bases in cells of an  $n \times n$  array, elements of  $B_i$  in the  $i$ -th column, such that elements of each row also form a basis of  $M$ .*

We present a short proof of the conjecture for the class of sparse paving matroids of rank  $n$ , i.e. matroids whose circuits have  $n$  or  $n+1$  elements and every two  $n$  element circuits intersect in less than  $n-1$  elements. It is conjectured that asymptotically almost all matroids are sparse paving.