

## Romanian Software's for Cutting Stock Problems

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**Abstract:** After a short presentation of the author's contribution in the Cutting stock problems (CPP) solving, we shell present shortly too the contribution of other Romanian peoples based on published and only presented papers in the field of CCP-software

The software elaboration and some industrial application are also presented.

Some statistical results, concerning these topics using published software is given too.

**Key words:** Software for cutting, applications, Romania

### INTRODUCTION

In this paper, software construction and industrial application solving practical Cutting stock problems (CSP) are presented.

Some statistical results, concerning this topics using published software are given.

A list of some published papers and not published (presented) results are also presented.

### CONTRIBUTION, EXPERIENCE

In the years 1971 and 1972 we have published 3 papers [3], [4], [26] and later a book [2] concerning a new method for solving two-dimensional cutting stock problem. A method used is based on Monte Carlo technique for column generation linear programming method. For column generation is the by shadow prices given distribution is used. The placing the pieces on the support is also own and is made in order of SWE (southwest and east) is special form of guillotine cutting theologies.

Based of this method a software package is also written, named CROCODILE, described in [4], [5] and [6].

This Software are experimented and applicated about 35 years in different industries and different enterprises ( see application chapter of this paper).

### SOFTWARE

Many own software and software written by other people are available in Romanian space. A list of them, in chronological order, is given below Table 1 and Table 2.

Name of Software	CCP Dimension	Authors	Method used	Hardware constrains	Referenc.
CROCODIL	1,1.5, 2	Fabian, Duță	LP, SWE	IBM-360, 370	[3]
CROCODIL	1,1.5, 2	Fabian, Duță	LP. SWE	Felix C-156	[4]
CROCODIL	1,1.5, 2	Fabian, Duță	LP, SWE	Felix C-256	[5]
LYSARD	1,1.5, 2	Fabian, Duță	LP, Gilmore – Gomory	Felix C-256	[18]
GREEDY	1,1.5, 2	Fabian	Greedy for LP	PDP11	[19]
JOCRO	1,1.5, 2	Fabian	Own, Interactive	PDP11	[20]
UNICUT	1	Fabian	Own, special problems	PC	[21]
CROBAT, OLCRED CROBOB	1,2	Oprea, Tigan		Felix C-156	[24]

Table 1. Cutting stock software created by the author

Name of Software	CCP Dimension	Authors	Method used	Hardware constrains	Referenc.
DEED	2	Pătruț		Felix C-156	[25]
DUOCC	2	Costescu Miclăuș		Felix C-156	[1]
LIPFOG	2	* * *		Felix C-156	[22]
LIFCOM	2	* * *		Felix C-156	[23]
COREP	2	Zeciu, Fabian		PDP11	[27]
CROMETPC	2	* * *		PC	[29]
DEC++	2	* * *			[28]

Table 2. Cutting stock software created in Romania

The author and some coauthors (in collective) have realized the same number of software's (8) as all another authors (7) (taking part from 6 different collectives). The software's are realized in principal two periods 1975-1980 and 1986-1989.

By the authors software are more general one (column 2 from Table 1.)

The authors of papers are different from people writing software's only the author has writing paper and also software.

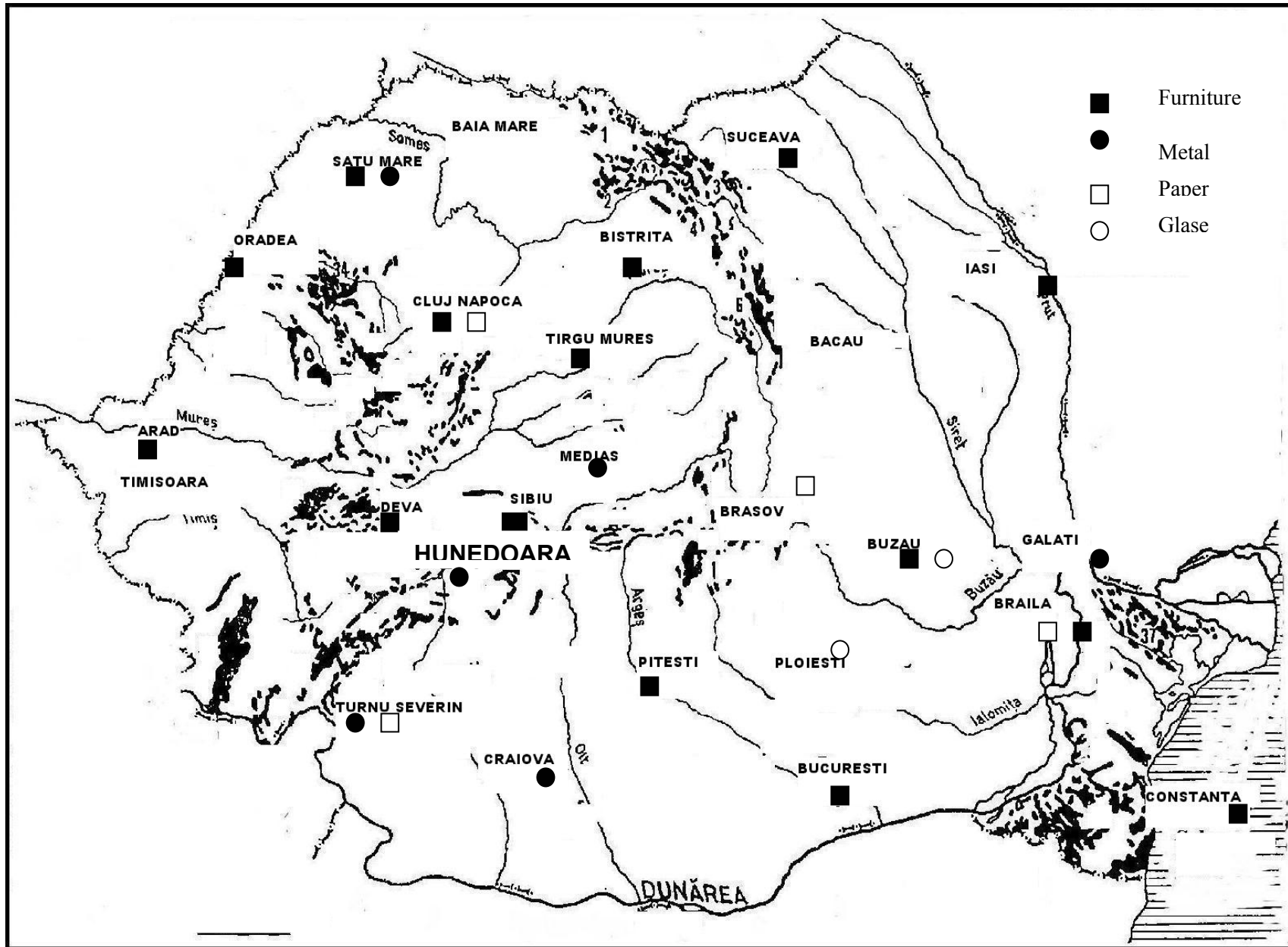
### **APPLICATIONS**

The necessity of solving industrial concrete problems leads us to study the CPP and to elaborate software for them. About 30 furniture factories are asked us, during these years,

For different solution of CPP problems, some packing paper factories, factories using metals and for other material cutting are over industrial application field.

The map shows the application area of CROCODILE in different domain and places in Romania.

The applications realized by other people are in the field of wood, metal, textile and navy pieces cutting.



## CONCLUSION

It is clear that in Romania there are very intense preoccupations in theoretical and practical application in CPP from begging in the year 1963 up to now.

The following histograms illustrate the repartitions of number of reported software's in time.

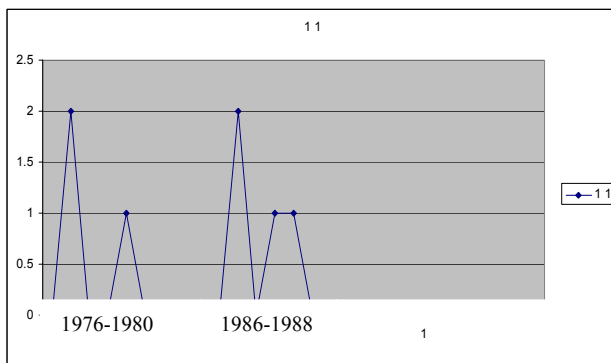


Figure 1. Nr of software creating reported in time

Many cutting software are written in Romania (~15)

The first and the most software in Romania is created by the authors

Many students used, during the years the published papers and the available software packages, as an inspiration for their diploma works.

In CAER CROCODILE software package for solving concrete CSP problems also used.

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