

# **Synthesis Of MVL Functions - Part I: The Genetic Algorithm Approach**

Sarif, Bambang A. B. Abd-El-Barr, Mostafa; Department of Computer Engineering,  
KFUPM, KSA, +966-3-8604920, sarif@ccse.kfupm.edu.sa;

**Microelectronics, 2006. ICM '06. International conference; Publication Date: 16-19  
Dec. 2006; ISBN: 1-4244-0765-6**

King Fahd University of Petroleum & Minerals

**<http://www.kfupm.edu.sa>**

## **Summary**

Multiple-Valued Logic (MVL) has been used in the design of a number of logic systems, including memory, multi-level data communication coding, and a number of special purpose digital processors. Several algorithms have been proposed in the literature for synthesis of multiple valued logic functions. None of these algorithms provides absolute optimum results for synthesis of these functions. The search space is too large to be explored by deterministic algorithms. In this paper, a Genetic Algorithm based algorithm for synthesis of MVL functions is proposed. The algorithm is tested using 200 randomly generated 2-variable 4-valued functions. The results obtained show that the introduced algorithm outperforms the deterministic technique based on the direct cover approach [3] in terms of the average number of product terms required to realize a given MVL function.

For pre-prints please write to: [abstracts@kfupm.edu.sa](mailto:abstracts@kfupm.edu.sa)