Accepted Manuscript

Polynomial pattern finding in scattered data

D. Barrera, M.J. Ibáñez, A.M. Roldán, J.B. Roldán, R. Yáñez

PII: S0377-0427(16)30554-4
DOI: http://dx.doi.org/10.1016/j.cam.2016.11.021
Reference: CAM 10894

To appear in: *Journal of Computational and Applied Mathematics*

Received date: 9 June 2016
Revised date: 7 November 2016

Please cite this article as: D. Barrera, M.J. Ibáñez, A.M. Roldán, J.B. Roldán, R. Yáñez, Polynomial pattern finding in scattered data, *Journal of Computational and Applied Mathematics* (2016), http://dx.doi.org/10.1016/j.cam.2016.11.021

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Polynomial pattern finding in scattered data

D. Barrera [a] M. J. Ibáñez [a,*] A. M. Roldán [b] J. B. Roldán [b] R. Yáñez [a]

[a] *Department of Applied Mathematics, Faculty of Sciences, University of Granada, Spain.*

[b] *Department of Electronics, Faculty of Sciences, University of Granada, Spain.*

Abstract

A new numerical procedure to extract the threshold voltage in MOSFET transistors has been developed by means of polynomial pattern recognition. The technique proposed here is based on the use of particular properties of discrete orthogonal Chebyshev polynomials, it allows the extraction of polynomial curves of different degrees within a set of experimental or simulated data. For the MOSFET threshold voltage determination we have detected linear patterns in the logarithmic representation of MOSFET transfer characteristics (drain current versus gate voltage curves). The results have been compared with the threshold voltage obtained with a classical technique, the transconductance change method, where the maximum of the drain current second derivative is assumed as the threshold voltage. Reasonable and comparable results are obtained. The new technique has shown more immunity to numerical and measurement noise, which is an important feature in the current industrial context.

Key words: MOSFET Threshold voltage, Polynomial pattern, Chebyshev polynomials.
PACS: 33C45, 65D15.

1 Introduction

The advances achieved in the micro- and nano-electronic industry in the last fifty years are mainly based on the continuous scaling of the circuit com-

* corresponding author.
Email addresses: dbarrera@ugr.es (D. Barrera), mibanez@ugr.es (M. J. Ibáñez), amroldan@ugr.es (A. M. Roldán), jroldan@ugr.es (J. B. Roldán), ryanez@ugr.es (R. Yáñez).

Download English Version:

https://daneshyari.com/en/article/5776413

Download Persian Version:

https://daneshyari.com/article/5776413

Daneshyari.com