بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

MONA MAGHRABY

OPTIMIZING HYDRAULIC FRACTURING PARAMETERS USING GENETIC PROGRAMMING

By

Esraa Osama Ibrahim Mousa

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfilment of the
Requirements for the Degree of

INTERDISCIPLINARY-MASTER OF SCIENCE
in
GAS PRODUCTION ENGINEERING

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Prof. Dr.Eissa Shokir

Professor of Petroleum Engineering
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Title of Thesis:

Optimizing Hydraulic Fracturing Parameters Using Genetic Programming.

Key Words:

Hydraulic Fracturing; Fracture Half-length; Fracture Pressure; Fracture Width; Genetic Programming

Summary:

The researcher studied the development of new three simple models to predict the hydraulic fracturing parameters using artificial intelligence technique (Genetic Programming). The main three parameters are Fracture Pressure, Fracture Half Length and the Fracture Width. Where the inputs of the first model for calculating the fracture pressure are: current pressure, porosity, permeability, depth, Young's modulus, Poisson ratio. The inputs for the fracture half-length model are: Fracture Pressure, young's modulus, permeability, reservoir thickness. The inputs for fracture width model are: Fracture Pressure, Poisson ratio, permeability, reservoir thickness. The models were built using 180 points and verified using Monte Carlo technique. In addition, it was verified against three actual case studies.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been Submitted for a degree qualification at any other university or institute. I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name: Date:

Signature:

Dedication

I am dedicating this thesis to my beloved family, husband, friends, workmates and all those who helped me to complete this work.

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Firstly, I'd like to express my gratitude to my patient and supportive supervisor Prof. Eissa Shokir who has supported me throughout my master's thesis.

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