شبكة المعلومات الجامعية

بسم اللّه الرحمن الرحيم

شبكة المعلومات الجامعية
التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم باللّه 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

بعض الوثائق الأصلية تالفة

شبكة المعلومات الجامعية

بالرسالة صفحات لم ترد بالأصل

NOVEL ACTIVE LEARNING BASED APPROACHES FOR BALANCING MULTI-OBJECTIVE MAXIMIZATION USING TRADE-OFF BETWEEN EXPLORATION AND EXPLOITATION

By

Dina Ahmed Mohamed Mohamed Elreedy

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY
in
Computer Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Title of Thesis:

Novel Active Learning based Approaches for Balancing Multi-Objective Maximization Using Trade-off between Exploration and Exploitation

Key Words:

active learning; exploration-exploitation; mutual information; Kullback–Leibler divergence; query synthesis

Summary:

In this thesis, we develop two novel approaches for optimization problems incurring exploration-exploitation trade-off. First, we propose a new comprehensive active learning framework including exploration-based, exploitation-based, and balancing methods. Second, we develop several analytical formulations for handling exploration-exploitation trade-off by explicitly incorporating an exploration term depending on the learning model uncertainty. We apply our proposed approaches to an operations research related application which is dynamic pricing with demand learning. We perform experiments on synthetic and real datasets. The experimental results show superior performance of our proposed approaches in terms of the achieved utility (exploitation) and estimated model error (exploration).

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.

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Signature:

Dedication

To my lovely supportive parents for their unconditional love and care, and to my supportive success partner, my husband, Mohab.

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