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HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGY

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GRADUATION THESIS

DEPARTMENT OF COMPUTER SCIENCE

TITLE TITLE TITLE TITLE TITLE TITLE TITLE TITLE TITLE TITLE TITLE TITLE TITLE TITLE TITLE TITLE

Name : Nguyen Van X
Student ID : 2015XXXX
Class : ICTX - K6X
Supervisor : Associate Professor X

Hanoi, May 2020

Graduation mission ticket

Student information

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- **Program:** Bachelor of Engineering
- **Duration:** From Month 202X to Month 202X

Main purpose of the thesis

1. Research about
2. Research and apply

Specific mission of the thesis

1. Research
2. Apply
3. Implement
4. Conduct the experiments, synthesize and analyze the result.

Pledge of student

I am *Nguyen Van X* guarantee that this thesis is my own work under the supervision of Associate Professor X.

The proposals and results in this thesis are authentic and original. ·

Hanoi, xx^{th}, Month 202X

Author of thesis

Nguyen Van X

Confirmation for the completeness of the thesis and permission for the thesis to be defense from supervisor

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Hanoi, xx^{th}, Month 202X

Supervisor

Assoc Prof. X

Acknowledgement

I would like to thanks

Hanoi, xx^{th}, Month 202X
Nguyen Van X

Abstract

Abstract of your thesis
The thesis is organized as follows:

- **Chapter 1** provides
- **Chapter 2** introduces
- **Chapter 3** presents
- **Chapter 4** represents

Preface

Describe overview of the field and your motivation why are you doing this topic

Glossaries

Acronym	**Full terminology**
EA	Evolutionary Algorithm
GA	Genetic Algorithm
EP	Evolutionary Programming
GP	Genetic Programming
ES	Evolution Strategies
MFO	Multifactorial Optimization
MOO	Multi Objective Optimization
ANN	Artificial Neural Network
MFEA	Multi Factorial Evolutionary Algorithm
MDP	Markov Decision Process
RL	Reinforcement Learning
SL	Supervised Learning
SBX	Simulated Binary Crossover
FSM	Functional Synergies Measure

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Chapter 1

Introduction

1.0.1 Deep Q-Network

Deep Q-network [1]

Chapter 2

Problem formulation

Chapter 3

Proposed method

3.0.1 New algorithm

Algorithm 1 Assortative mating

Consider two parent candidates p_a and p_b randomly selected from $current - pop$

1: Generate a random number $rand$ between 0 and 1
2: **if** $(\tau_a == \tau_b)$ or $(rand < rmp)$ **then**
3: Parents p_a and p_b crossover to give two offspring individuals c_a and c_b
4: **else**
5: p_a is mutated slightly to give an offspring c_a
6: p_b is mutated slightly to give an offspring c_b
7: **end if**

Chapter 4

Result

4.0.1 Small instance

Gravity	EA				MFEA			
	Best	**Mean**	**Std**	**Time (s)**	**Best**	**Mean**	**Std**	**Time**
gravity=0.80	200.00	200.00	0.00	1.10	200.00	200.00	0.00	1.13
gravity=10.80	200.00	200.00	0.00	1.10	200.00	200.00	0.00	1.13
gravity=20.80	200.00	200.00	0.00	1.10	200.00	200.00	0.00	1.13
gravity=30.80	200.00	200.00	0.00	1.10	200.00	200.00	0.00	1.13
gravity=40.80	200.00	200.00	0.00	1.10	200.00	200.00	0.00	1.13
gravity=50.80	200.00	196.95	11.29	1.10	200.00	**200.00**	0.00	1.13
gravity=60.80	200.00	199.99	0.04	1.10	200.00	**200.00**	0.00	1.13
gravity=70.80	200.00	189.38	24.78	1.10	200.00	**200.00**	0.00	1.13
gravity=80.80	200.00	191.43	18.90	1.10	200.00	**199.31**	2.95	1.13
gravity=90.80	200.00	167.84	26.90	1.10	200.00	**193.62**	11.08	1.13

Table 4.1: some description

Conclusion

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