EVALUATION OF PES 2021 GAME PERFORMANCE USING THE NDFA METHOD

TESIS

Submitted to meet some of the requirements for achieving a Bachelor of Computer Degree

COMPILED BY:

MUHAMMAD IQBAL SYAMWARDANA 1811102441111



FACULTY OF SCIENCE AND TECHNOLOGY

MUHAMMADIYAH UNIVERSITY OF

EAST KALIMANTAN SAMARINDA

2022

Evaluation of PES 2021 Game Performance using the NDFA Method

TESIS

Submitted to meet some of the requirements for achieving a Bachelor of Computer Degree

Compiled By:

Muhammad Iqbal Syamwardana 1811102441111



STUDY PROGRAM S1 INFORMATICS ENGINEERING

FACULTY OF SCIENCE AND TECHNOLOGY

MUHAMMADIYAH UNIVERSITY OF

EAST KALIMANTAN SAMARINDA

2022

APPROVAL SHEET

EVALUATION OF PES 2021 GAME PERFORMANCE USING THE NDFA METHOD

COMPLETED BY:

MUHAMMAD IQBAL SYAMWARDANA 1811102441111

Has been examined and passed,

At of 13 June 2022

Supervisor

Arbansyah, S.Kom., M.TI

NIDN: 1118019203

Examiner

Asslia Johar Latipah, M.Cs

NIDN: 1124098902

Dean

Prof. Ir. Sarjito, MT., Ph.D.

NIDN: 0610116204

Head Of Program

straight Latipah, M.C.

NIDN 1124098902

THESIS AUTHENTICITY STATEMENT PAGE

The ones listed below,

Student name

: Muhammad Iqbal Syamwardana

NIM

: 1811102441111

Concentration

: Information Systems

States that the Thesis with the following title:

EVALUATION OF PES 2021 GAME PERFORMANCE USING THE NDFA METHOD

Supervisor

: Arbansyah, S.Kom., M.TI

- This paper is ORIGINAL and has NEVER been submitted for a Bachelor of Computer degree, either
 at the University of Muhammadiyah East Kalimantan (UMKT) or at other universities
- 2. This paper is my own ideas, formulations and research, without the help of other parties except the direction of the Supervisor
- 3. In this paper there is no work or opinion of any other person, unless in writing it is clearly stated as a reference in the manuscript with the name of the author mentioned and mentioned in the Register Library on this paper
- 4. The software used in this study is entirely my responsibility, not the responsibility of the University of Muhammadiyah East Kalimantan (UMKT)
- This statement I make in fact, if in the future there are irregularities and untruths in this statement, then I am willing to accept ACADEMIC SANCTIONS with the revocation of the degree which has been obtained, as well as other sanctions in accordance with the norms in force at Muhammadiyah University.

Samarinda, June 6, 2022

Which States,

266

Muhammad Iqbal Syamwardana 1811102441111

AE70AJX644717380

iv

INTRODUCTION

Alhamdulillah, by expressing praise for the presence of Allah SWT, because with His instructions this thesis with the title "evaluation of the performance of the pes 2021 game using the ndfa method" can be the author complete it on time, as one of the requirements for completing lecture assignments and to achieve the graduation requirements of the University of Muhammadiyah East Kalimantan Samarinda.

All the shortcomings in writing this thesis are very much realized by the author, but with moral and material assistance from various parties, all completeness can be fulfilled in writing. For this reason, on this occasion, the author should express his highest gratitude and appreciation to various parties who have directly or indirectly been provide his help.

- 1 Mr. Prof.Dr.Bambang Setiaji as the rector of the University of Muhammadiyah East Kalimantan, and Prof. Ir. Sarjito, M.T., Ph.D as dean of the Faculty of Science and Technology, University of Muhammadiyah, East Kalimantan, has been pleased to provide an opportunity for the author to complete his studies at the University of Muhammadiyah East Kalimantan.
- 2. Mrs. Asslia Johar Latipah,S. Kom., M.Cs as the head of the Informatics Engineering study program.
- 3. Mr. Arbansyah, S.Kom., M.TI as a supervisor who has provided input guidance and suggestions that are very helpful in perfecting this thesis.
- 4. All lecturers of the Informatics Engineering study program and all lecturers at the University of Muhammadiyah East Kalimantan who have provided a lot of knowledge to the author so that they can complete thesis writing as one of thesis requirements for obtaining a bachelor's degree in computer science.

5. His beloved parents and siblings who always give affection, do'a, advice, as well as for his extraordinary patience face in every step of the author's life, which is the greatest gift in life.

6. Colleagues in the Informatics Engineering study program at the University of Muhammadiyah, East Kalimantan, who have provided a lot of thought and motivation assistance until the author can complete it.

Samarinda, June 6, 2022

Writer

ABSTRACT

In this study, non-deterministic finite automata (NDFA) were used to design the pro evolution soccer 2021 (PES 2021) game model, the PES 2021 game is a real simulation of the sport of football by using game controls to play or controlling player activity. Game controls are presented as symbols until each game character has different characteristic behaviors. An evaluation is carried out after the analysis of the game and can be presented on the digraph using the NDFA model to define the transition function.

Keywords: Non-deterministic finite automata (NDFA), pro evolution soccer 2021 (PES2021), Evaluation

TABLE OF CONTENTS

APPROVAL SHEET	i
THESIS AUTHENTICITY STATEMENT PAGE	ii
INTRODUCTION	iii
ABSTRACT	v
TABLE OF CONTENTS	vi
TABLE LIST	. vii
LIST OF IMAGES	ix
APPENDIX LIST	x
CHAPTER 1 INTRODUCTION	1
1.1 Background	1
1.2 Problem Formulation	2
1.3 Purpose	2
1.4 Limitations of the Issue	3
CHAPTER II LITERATURE REVIEW	4
2.1 Related Research	4
2.2 Game	5
2.3 PES (Pro Evolution Soccer)	5
2.4 FSM (Finite state machine)	6
2.5 NDFA (Non-Deterministic Finite Automata)	7
CHAPTER III RESEARCH METHODOLOGY	9
3.1 Data Collection	9
3.2 Research Design	9
3.3 Activity Diagram in PES 2021	.10
CHAPTER 4 RESULTS AND DISCUSSION	.12
4.1 Character Identification	.12
4.1.1 Input/Output and State Identification	.12
4.1.2 Player Identification	.12
4.1.1 Controller Identification	.13

4.2 NDFA digraph model	14
4.2.1 NDFA model digraph Beginer	21
4.2.2 Professional digraph NDFA Model	30
4.2.3 NDFA Digraph Super Start Model	39
4.3 Evalution of NDFA Results	47
4.4 Match Evaluation Results	52
CHAPTER 5 CONCLUDING	55
5.1 Conclusion	55
5.2 Suggestion	55
BIBLIOGRAPHY	56
ATTACHMENT	59

TABLE LIST

Table 2. 1 Literature Studies	4
Table 4. 1 PES 2021 game player character	13
Table 4. 2 PES 2021 game controller	14
Table 4. 3 Beginner NDFA Transition	21
Table 4. 4 Professional NDFA Transition	30
Table 4. 5 NDFA Super Start Transition	39
Table 4. 6 Beginner Match Results	47
Table 4. 7 Professional Match Results	49
Table 4. 8 Super Start Match Results	50
Table 1 9 Evaluation	52

LIST OF IMAGES

Figure 3. 1 Research Design	9
Figure 4. 1 Activity Diagram	13
Figure 4. 2 Model NDFA Digraph Beginner	15
Figure 4. 3 Model NDFA Digraph Professional	19
Figure 4. 4 Model NDFA Digraph Super Start	24
Figure 4. 5 Beginner Game Average	30
Figure 4. 6 Professional Game Average	31
Figure 4. 7 Super Start Game Average	33

APPENDIX LIST

Attachment 1. Biography	60
Attachment 2. NDFA Modeling	61
Attachment 4. Letter No Reply	64
Attachment 5. Certificate of Not Validity Test	65
Attachment 6. Thesis guidance	66