EasyChair Preprint

№ 6225

Formal Theory of Pattern Sequence on Maiar DTD Game World.

Frank Appiah

August 4, 2021

Formal Theory of Pattern Sequence on Maiar DTD Game World.

FRANK APPIAH.

KING'S COLLEGE LONDON, SCHOOL OF ENGINEERING, LONDON, ENGLAND, UNITED KINGDOM.

appiahnsiahfrank@gmail.com. | frank.appiah@kcl.ac.uk

Extended Abstract[+]. This thesis is based on formal methods of grammar analysis focusing on pattern sequence of Maiar game world in DTD. It describes how pattern sequences are used to define the document types and element types.

Keywords. document types, formal theory, grammar, method, pattern, sequence .

Year of Study: 2017 **Year of Publication: 2020**

1 ***AFFILIATE. UNIVERSITY OF LONDON, KING'S COLLEGE LONDON, DEPARTMENT OF INFORMATICS, LONDON, UK.**

1 INTRODUCTION

In grammar analytic, here is about pattern sequences of a game world[1] defined from a document type definitions[2]. A schema defines a document type or class of documents by imposing a set of constraints on document instances. This thesis postulates that the pattern sequencs in document of type, *map* introduces the whole

content of the game world. The unified formalism for both document type definition and element type definition is sensed and provided.
It is achieved by new sequence operation into regular patterns. The basic composites of a regular expression are as follows:

1. *Variable*: It denotes an arbitrary expression. Y is a variable.
2. *Tagged Expression*: It is also denoted as m[Y].
3. *Pattern Sequence*: It is denoted as (Y | X).

A composition of the three composite elements need three simple operators:

- *Concatenation*: X, Y denotes the concatenation of the expressions X and Y.
- *Union*: X | Y denotes that a pattern can consist of either X or Y. and
- *Substitution*: is an expression enclosed by curly brackets and decorated label (l).

2 WORLD COMPOSITION

The pattern sequence notations(Bold text) of a game world as represented as from a Document Type Definition schema is as shown below:

2.1 Pattern Map Sequence

The three basic notations of Pattern map Sequence are:

- Variables : `exit, global, rooms, entry`.
- **Pattern Sequence**: `(exit | global | rooms | entry)`

2.2 Pattern Rooms Sequence

The basic notations of Pattern rooms Sequence are:

- Variable: `room`
- **Pattern Sequence**: `(room *)`

2.3 Pattern Room Sequence

The basic notations of Pattern room Sequence are:

- Variables: `id, name, commands, directions, items, look, intro`
- **Pattern Sequence**: `( id|name|commands|directions|items|look|intro )`

2.4 Pattern Intro Sequence

The basic notations of Pattern intro Sequence are:

- Variable: `message`
- **Pattern Sequence**: `(message)`

2.5 Pattern Look Sequence

The basic notations of Pattern Look Sequence are:

- Variable: `description`
- **Pattern Sequence**: `(description)`

2.6 Pattern Items Sequence

The basic notations of Pattern items Sequence are:

- Variable: `item`
- **Pattern Sequence**: `(item*)`

2.7 Pattern Item Sequence

The basic notations of Pattern item Sequence are:

- Variable: `name`
- **Pattern Sequence**: `(name)`

2.8 Pattern Directions Sequence

The basic notations of Pattern directions Sequence are:

- Variable: `north, south, east, west`
- **Pattern Sequence**: `(north | south | east | west)`

2.9 Pattern North Sequence

The basic notations of Pattern north Sequence are:

- Variable: `roomId`
- **Pattern Sequence**: `(roomId)`

2.10 Pattern South Sequence

The basic notations of Pattern south Sequence are:

- Variable: `roomId`
- **Pattern Sequence**: `(roomId)`

2.11 Pattern East Sequence

The basic notations of Pattern east Sequence are:

- Variable: `roomId`
- **Pattern Sequence**: `(roomId)`

2.12 Pattern West Sequence

The basic notations of Pattern west Sequence are:

- Variable: `roomId`
- **Pattern Sequence**: `(roomId)`

2.13 Pattern Commands Sequence

The basic notations of Pattern commands Sequence are:

- Variable: `command`
- **Pattern Sequence**: `(command*)`

2.14 Pattern Command Sequence

The basic notations of Pattern command Sequence are:

- Variable: `name, action`
- **Pattern Sequence**: `(name | action*)`

2.15 Pattern Action Sequence

The basic notations of Pattern action sequence are:

- Variable: `requirement, effect`
- **Pattern Sequence**: (`requirement* | effect*`)

2.16 Pattern Effect Sequence

The basic notations of Pattern effect sequence are:

- Variable: `operator, value, parameter`
- **Pattern Sequence**: (`operator | value | parameter`)

2.17 Pattern Requirement Sequence

The basic notations of Pattern requirement sequence are:

- Variables: `notSatisfied, satisfied, value, parameter`
- **Pattern Sequence**: (`value|parameter|notSatisfied* |satisfied*`)

2.18 Pattern Notsatisfied Sequence

The basic notations of Pattern Notsatisfied sequence are:

- Variable: `action`
- **Pattern Sequence**: `(action*)`

2.19 Pattern satisfied Sequence

The basic notations of Pattern satisfied sequence are:

- Variable: `action`
- **Pattern Sequence**: `(action*)`

2.20 Pattern Global Expression

The basic notations of Pattern global sequence are:

- Variable: `command`
- **Pattern Sequence**: `(command*)`

2.21 Pattern Exit Sequence

The basic notations of Pattern exit sequence are:

- Variable: `id, room`
- **Pattern Sequence**: `(id | room)`

4 CONCLUSION

This section concludes work on grammar analysis on document type definition with pattern sequences. There were about 20 pattern sequences analyzed to generate each element of *map* document content element. This forms part of one of the formal thesis on world grammar of Maiar game DTD based on pattern sequence notation.

Compliance with Ethical Standards:

(In case of funding) Funding: This is research is funded by King's Alumni Group, School of Engineering with postgraduate grant with ISAreference grant number: 204424 20821845.

Conflict of Interest:

Author, Dr. Frank Appiah declares that he has no conflict of interest .

REFERENCES

1. Appiah F. (2012/13), Design and Implementation of a Graph-based Game, KCL School of Engineering, PhD Dissertation,
2. Berthold B.(2003). Modeling Business Objects With XML Schema. Morgan Kauffman, Elsevier Publishers.