

Graphic Model Modification Structure Expressed by Natural Language Text

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1. Introduction

In recent years the contents creation in the film, TV, games, audiovisual production is exploding. Digitalization of the production process made it possible to rapid and large scale content creation and traditional production process became almost obsolete to accommodate the production schedule and human and monetary resources. To overcome these trends, the content industries pre-visualization to measure the resources. But the pre-visualization also takes significant amount of the resources, thus burdens to the production. To a small scale production, the pre-visualization cost is too much to deal with.

This study aims to enable fast and semi-automatic visualization of screen play and kid's book. By applying the natural language processing and graphics presentation of objects to the textual descriptions, illustration of the text is automatically generated. The study could be applied to a variety of genres, such as game, education, ad and comic.

2. Structure of Language Expression Axis

The Language Expression Axis (L.E.A) represents the shapes, colors, textures of the given textual description. The L.E.A presents externals of the object or character being described. Each L.E.A state consists of single or multiple expressions connected together. The state expression has simple or complex form. The simple state expression is in form of colors, size or shape and texture. The complex state expression combines two or more of these expressions. For example, stating the object's color or size and smoothness is simple, whereas complex expression could combines aspect of color and smoothness like tarnished yellow by old age. The natural language processor parses the given textual description and produces color, size, and textual presentation parameters of the object.

3. Structure of Graphics Expression Axis

The Graphics Express Axis (G.E.A) represents the graphical operations which could be applied to the graphics models. The G.E.A has three operation types and associated parameters for each operation types. The operation types are color modification, size modification, and texture modification.

The color modification has colors and associated importance order as the parameters. The texture modification has specific expression like smooth, crude, rough, slippery and associated graphics shader with expression texture and magnitude as the parameters. The size modification has height, length, and scale factor as the parameters. Every modification has one's own parameter and should not affect other modification.

4. Link Structure of L.E.A and G.E.A

The input text is processed though Natural Language Processor and morphological analysis and sentence parsing are applied to produce expression of L.E.A. The morpheme of the input text are analyzed and categorized by textual description like color, size and texture. The N.L.P utilize KKMA corpus and analyzer[3] of 21st Century Sejong Project[4] with additional corpus of fairy tales from elementary school text book. The result of the parser is searched with pre-defined keywords which are selected to match G.E.A modifiers.

To link the expression extracted from the parser, every expression is searched from data base of keywords and appointed words. The appointed word is specific expression phrase and has a link of pre-defined modifier and parameters. For example, golden axe is yellow axe with metallic shader and texture.

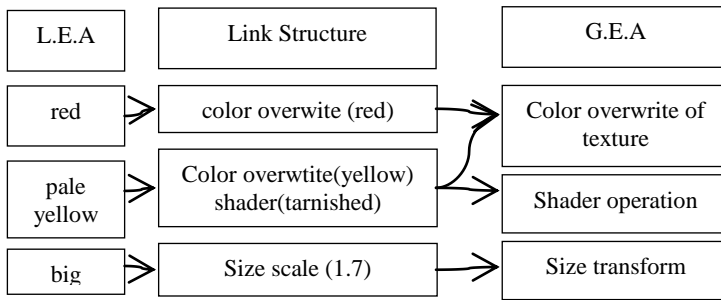


Figure 1. L.E.A and G.E.A Link Structure



Figure 2. Ox and Black, Yellow Ox

Link structure of the L.E.A and the corresponding G.E.A is presented in **Figure.1**. The link structure is editable xml with reference to the graphics object, color table, texture and shaders with pre-determined parameters. A expression from L.E.A is linked to several operation of G.E.A. An entry of the link structure acts like procedural function call.

Actual parameter and link value is determined by style of user's choice. The system provides editable override of user preference.

Figure.2 and **Figure.3** show modification of Ox and Axe models with Black, Yellow and Golden, Silver modifiers.

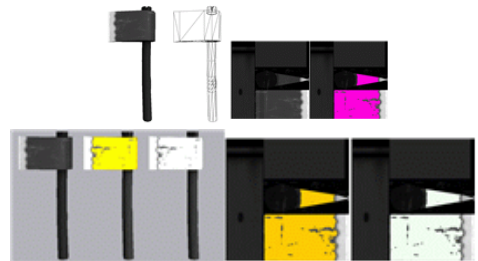


Figure 3. Axe and Golden and Silver Axe

5. Discussion and Future Work

In this study, the natural language processing and the graphic modification scheme is presented. The scheme can extend the limited graphics asset with various modifiers. This scheme can easily adapt to the user's preferred style by providing editable and overriding link structure. But the scheme does not include the capacity of the emotional expressions[5]. To solve these problems, parsing and semantic analysis of sensual and emotional expression and graphical modifier of emotion should be studied.

6. References

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