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Rule Based Text Analysis for Real Time Graphical Generation

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ABSTRACT

The process of text to image generation becomes more sophisticated through the decade by earlier methods proposed in this and most of them struggle with the resultant accuracy generated by them. The text to graphics or image generation needs to be more accurate in representing the semantic of the statement. We propose a new rule based text analysis framework for real time generation of graphics, which follows the semantic rules and phonetic symbols. The proposed method contains four components namely semantic rule base, text analyzer, graphics generator. The rule base contains set of rules like lexical analysis where the property of various component and rules based on them are stored. The text analyzer extracts the basic feature of the statement and identifies the object and its properties where as the graphics generator moulds the graphics according to the object properties. The proposed system uses OOAD methods for generation and verification of graphics.

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INTRODUCTION

Artificial intelligence becomes more sophisticated now a days and more automatic knowledge transferring machines has become more popular due to the technology developments. The crime investigating departments are more dependent to these ideas like text to images where the words of witness have to be formed in such a way to represent the accused who involved in the crime.

The popular word eye has been designed to fix the requirement of text to image conversion and to provide a blank slate where the user can literally paint a picture with words, where the description may consist not only of spatial relations, but also actions performed by objects in the scene. The text can include a wide range of input. We have also deliberately chosen to address the generation of static scenes rather than the control or generation of animation. This affords us the opportunity to focus on the key issues of semantics and graphical representation without having to address all the problems inherent in automatically generating

Convincing animation. The expressive power of natural language enables quite complex scenes to be generated with a level of spontaneity and fun unachievable by other methods there is a certain magic in seeing one's words turned into pictures.

Text-to-scene conversion systems aim to give imaginations to computers. When given a text description, a TTSCS will convert that description to a static scene or an animation. TTSCS have many applications. Novice users who are unfamiliar with state-of-the-art animation tools can convert imagined movies into real ones.

Story visualization is a technique of converting textual story into pictorial representation. For example a story of forest can be converted into cartoons and graphical video using this story visualization technique. There are various researches are ongoing for the development of text to scene technology using which any verbal information can be transferred into graphical representations.

Related works:

There are many researchers working on this, but we acknowledge few of them here. Words Eye (2001) works as follows. An input text is entered; the sentences are tagged and parsed. Then parsed sentence is sent to semantic interpreter to get the semantic representation. Depiction rules are used to convert the semantic representation to a set of low-level depictors and these depictors are rendered to create 3D scenes.

Intentions and expectations in animating instructions (Badler, N., 1993), demonstrate that agents' understanding and use of instructions can complement what they can derive from the environment in which they act. They focus on two attitudes that contribute to agents' behavior , their intentions and their expectations- and

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shown how Natural Language instructions contribute to such attitudes in ways that complement the environment. They also show that instructions can require more than one context of interpretation and thus that agents' understanding of instructions can evolve as their activity progresses. A significant consequence is that Natural Language understanding in the context of behavior cannot simply be treated as "front end" processing, but rather must be integrated more deeply into the processes that guide an agent's behavior and respond to its perceptions.

Constraint-based conversion of action text to a time-based graphical representation (Richard Johansson, 2005), presents a method for converting unrestricted fiction text into a time-based graphical form. Key concepts extracted from the text are used to formulate constraints describing the interaction of entities in a scene. The solution of these constraints over their respective time intervals provides the trajectories for these entities in a graphical representation. Three types of entity are extracted from fiction books to describe the scene, namely Avatars, Areas and Objects. We present a novel method for modeling the temporal aspect of a fiction story using multiple time-line representations after which the information extracted regarding entities and time-lines is used to formulate constraints. A constraint solving technique based on interval arithmetic is used to ensure that the behaviour of the entities satisfies the constraints over multiple universally quantified time intervals. This approach is demonstrated by finding solutions to multiple time-based constraints, and represents a new contribution to the field of Text-to-Scene conversion.

Automatic text-to-scene conversion in the traffic accident domain, describe a system that automatically converts narratives into 3D scenes. The texts, written in Swedish, describe road accidents. One of the program's key features is that it animates the generated scene using temporal relations between the events. We believe that this system is the first text-to-scene converter that is not restricted to invented narratives. The system consists of three modules: natural language interpretation based on information extraction (IE) methods, a planning module that produces a geometric description of the accident, and finally a visualization module that renders the geometric description as animated graphics.

Data Collection and Normalization for Building the Scenario-Based Lexical Knowledge Resource of a Text-to-Scene Conversion System (Masoud Rouhizadeh, 2011), explores information collection methods for building the SBLR, using Amazon's Mechanical Turk (AMT) and manual normalization of raw AMT data. The paper follows with manual review of existing relations in the SBLR and classification of the AMT data into existing and new semantic relations. Since manual annotation is a time-consuming and expensive approach, we also explored the use of automatic normalization of AMT data through log-odds and log-likelihood ratios extracted from the English Gigaword corpus, as well as through WordNet similarity measures.We propose a new rule based text to scene generation framework which uses various rule set for the graphics generation.

Proposed Method:

The proposed graphics generation method uses various rule sets , where for each object to be generated it maintains set of properties and rules. Whatever the text specified will be processed for identification of objects and properties of the identified object. Based on the object properties the graphics is generated for the visualization of the user. The proposed method has the following stages namely: Text analyzer, Rule Mapping, Graphics Generation.

Text Analysis:

The input text submitted by the user is split into single words and given to the text analysis. The text analyzer reads the objects and their properties from the rule set and search for the object name in the input text for the identification of object specified in the query. Once the object name is identified then the properties of the objects are collected from the rule set. For each property of object specified the text analyzer searches for the value given in the input text. The text analyzer collects all the property values from the input text and builds the object specified.

Algorithm:

Step1: start
Step2: read input text IText.
Step3: initialize obname, obprop.
Step4: read Objects&property list OP from rule set.
Step5: split IText into single terms.
WordToken = Ø(IText).
Step6: for each $Token_i$ from WordToken
Search for the object name in Op.
Obname= Ü(WordToken)X(OP.)//Obname is the identified object.
Obprop= obprop(obname).
End.

Step7: for each property pr of obname
Search for the value given in the text.
End.
Step8: create and initialize object with obname.
Step9: stop.

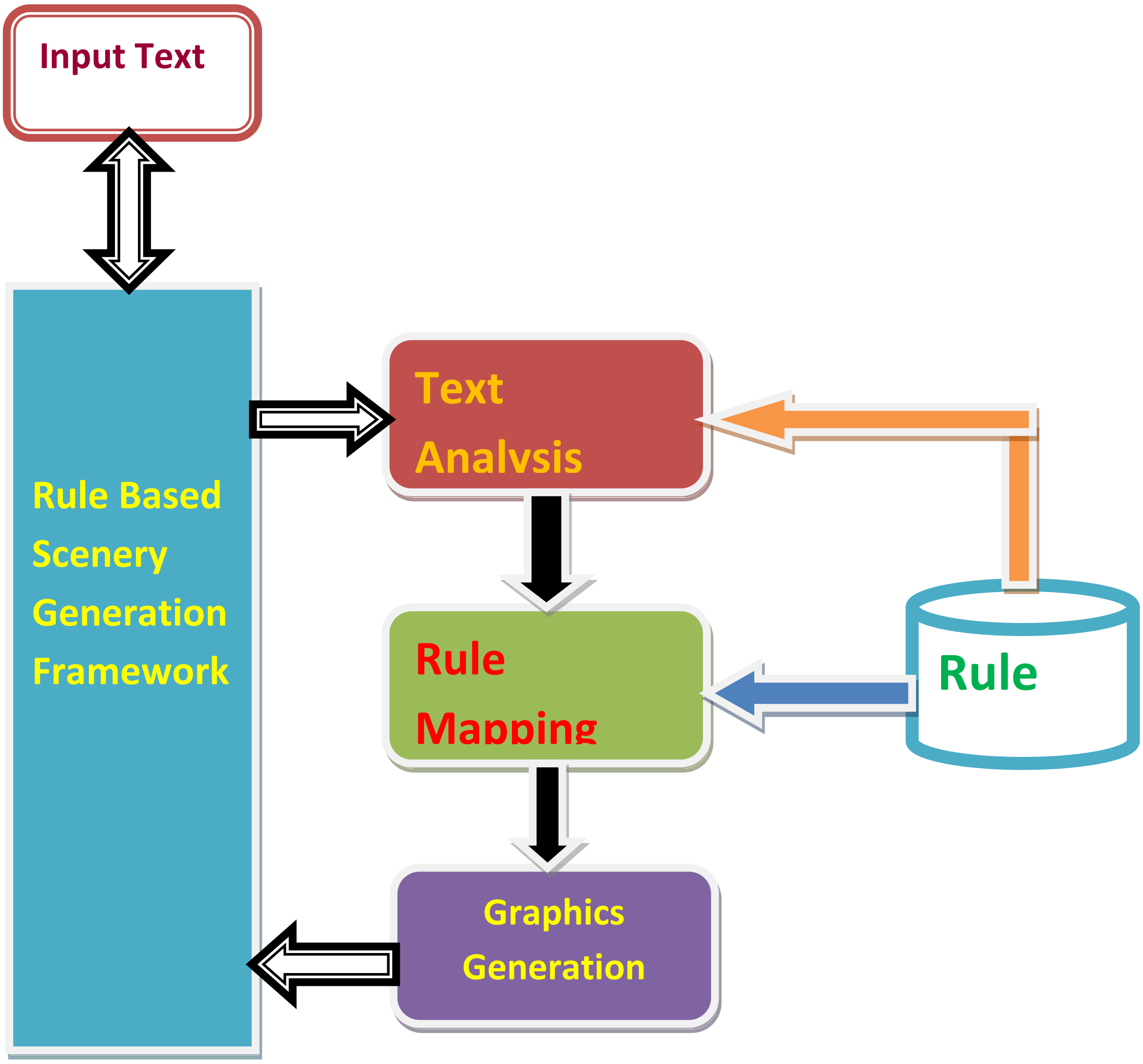

Fig. 1: Proposed System Architecture.

Rule Mapping:

The identified and created object is given to the rule mapping process. The rule mapping process is to evaluate the object and its property for proper values. It reads the rule set from the rule base and collects the information about the object submitted for mapping then checks for the presence of all properties specified in the rule. If all the properties are covered with the object submitted then its values are checked for their data types and then the object is approved.

Graphics Generation:

The constructed and verified object is given for graphics generation , the graphic generation is performed by using various parameters of the object. The graphics model maintains various procedures for each object and creates the graphics according to the model of the object. For example it maintains a model for a car which is having four wheels and doors and property as with or without top and with or without carrier and with or without follower and etc. Sometimes the query may contain relative values or relative fields like a car on the right side of the road. The graphics generation process checks for the overlapping and relevant object specified in the query.

RESULTS AND DISCUSSION

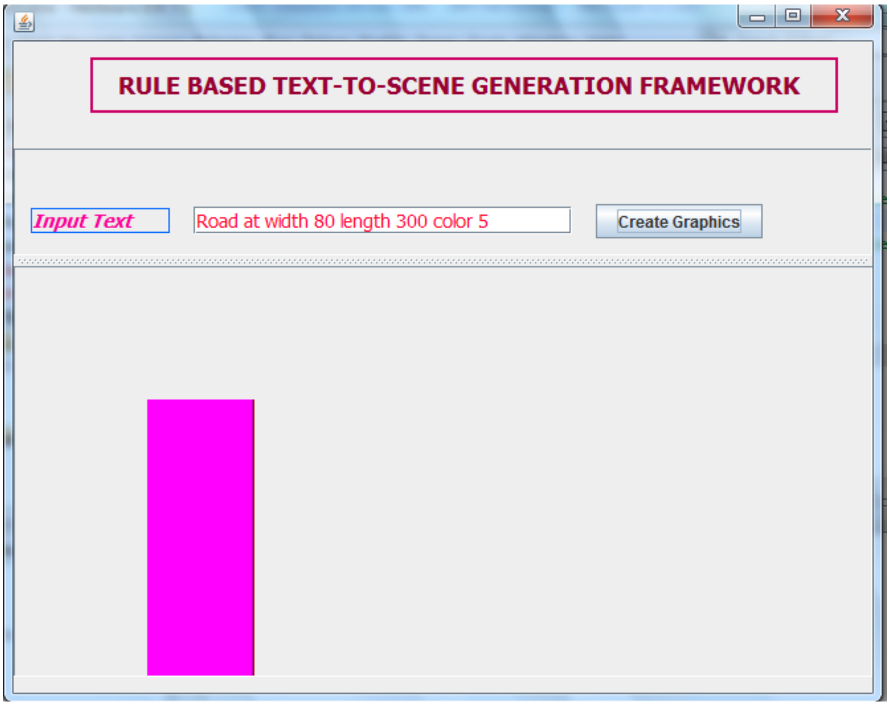

Fig. 2: Shows the result of the proposed system for submitted input text.

The figure 2 shows the result produced by the proposed method for a specified input text. It shows that the proposed system produces the graphics in specific rule based and in efficient manner.

Conclusion:

We discussed a rule based graphic generation methodology which generates graphics based on the rules specified in the rule base. The rule base contains various rules for different objects and it maintains set of properties as specified in the rule of an object. The text analyzer identifies the object to be generated graphically and it finds the properties mentioned on the input text. The rule mapper verifies the object generated and graphic generator creates graphics based on the submitted objects and its properties. The proposed method has produced efficient results and with little time and space complexity. The proposed method could be further improved by updating the rule set maintained.

REFERENCES

Adorni, G., M. Di Manzo and F. Giunchiglia, 1984. Natural Language Driven Image Generation. COLING 84: 495-500.

Alla Safonova and Jessica K. Hodgins, 2007. Construction and optimal search ofinterpolated motion graphs. ACM Trans. Graph., 26(3):106.

Badler, N., W. Becket, B. Di Eugenio, C. Geib, L. Levison, M. Moore, B. Webber, M. White and X. Zhao, 1993. "Intentions and expectations in animating instructions: the AnimNL project," in Intentions in Animation and Action, Institute for Research in Cognitive Science, University of Pennsylvania.

Bob Coyne and Richard Sproat WordsEye, 2001. An Automatic Text-to-Scene Conversion System. Siggraph Proceedings.

Bob Coyne and Richard Sproat, Wordseye, 2001. An automatic text-to-scene conver-sion system. ACM onComputer graphics and interactive techniques, pages 487-496.

Bob Coyne, Owen Rambow, Julia Hirschberg, Richard Sproat, 2010. Frame Semantics in Text-to-Scene Generation, in KES, Workshop on 3D Visualisation of Natural Language. Cardiff, Wales.

Bob Coyne, Owen Rambow, 2009. Meaning-Text-Theory and Lexical Frames, in Fourth International Conference on Meaning Text Theory. Montreal CA.

Bob Coyne, Owen Rambow, LexPar, 2009. A Freely Available English Paraphrase Lexicon Automatically Extracted from FrameNet, in IEEE-ICSC (International Conference on Semantic Computing). Berkeley CA.

Bob Coyne, Richard Sproat and Julia Hirschberg, 2010. Spatial Relations in Text-to-Scene Conversion, in Computational Models of Spatial Language Interpretation Workshop at Spatial Cognition. Mt Hood, Oregon.

Bob Coyne, Richard Sproat, Words Eye, 2001. An Automatic Text-to-Scene Conversion System, in SIGGRAPH Proceedings. Los Angeles, CA.

Bob Coyne, 2011. Evaluating a Text-to-Scene Generation System as an Aid to Literacy in Workshop on Speech and Language Technology in Education (SlaTE).

Boberg, Richard, 1972. Generating Line Drawings from Abstract Scene Descriptions. MIT MS Thesis, Dept. of Elec. Eng.

Clay, S.R. and J. Wilhelms, 1996. Put: Language-Based Interactive Manipulation of Objects. IEEE Computer Graphics and Applications, pages 31-39.

Dan Tappan, 2008. Knowledge-Based Spatial Reasoning for Scene Generation from Text Descriptions, Proceedings of the Twenty-Third AAAI Conference on Artificial Intelligence.

Kevin Glass and Shaun Bangay, 2006. Hierarchical rule generalisation for speakerIdentification books.South African institute of computer scientists andinformation technologists on IT research in developing countries, pages 31-40.

Kevin Glass and Shaun Bangay, 2007. Constraint-based conversion of action text to a time-based graphical representation. ACM pages 19-28.

Kevin Glass, Shaun Bangay and Bruce Alcock, 2007. Mechanisms for multimodality:taking action to another dimension. In AFRIGRAPH '07: Proceedings of the 5th international conference on Computer graphics, virtual reality, visualization and interaction in Africa, pages 135{144, New York, NY, USA. ACM.

Masoud Rouhizadeh, Margit Bowler, Richard Sproat, Bob Coyne, Data Collection and Normalization for Building the Scenario-Based Lexical Knowledge Resource of a Text-to-Scene Conversion System in 5th International Workshop on Semantic Media Adaptation and Personalization.

Masoud Rouhizadeh, 2011. Collecting Semantic Data by Mechanical Turk for the Lexical Knowledge Resource of a Text-to-Picture Generating System, The 9th International Conference on Computational Semantics.

Masoud Rouhizadeh, 2011. Collecting Spatial Information for Locations in a Text-to-Scene Conversion System, in Computational Models of Spatial Language Interpretation and Generation Workshop.

Owen Rambow Vig Net, 2011. Grounding Language in Graphics using Frame Semantics in the Workshop on Relational Models of Semantics (RELMS) at ACL.

Rama Bindiganavale, William Schuler, Jan M. Allbeck, Norman I. Badler, Ar-avind K. Joshi and Martha Palmer, 2000. Dynamically altering agent behaviors usingnatural language instructions. ACM, pages 293-300.

Richard Johansson, 2005. Automatic Text-to-Scene Conversion in the Traffic Accident Domain, Artificial Intelligence, IJCA, pages 1073-1078.

Richard Sproat, 2011. Collecting Semantic Information for Locations in the Scenario-Based Lexical Knowledge Resource of a Text-to-Scene Conversion System in KES.

Simmons, Robert and Novak, Gordon, 1975. Semantically Analyzing an English Subset for the CLOWNS Microworld. American Journal of Computational Linguistics, Microfiche, 18.

Yamada, Atsushi, 1993. Studies on Spatial Description Understanding Based on Geometric Constraints Satisfaction. Ph.D. dissertation, University of Kyoto.