The Seybold Report

ISSN 1533-9211

DOI 10.5281/zenodo.7409077

A REVIEW: AUTOMATIC SHORT STORY GENERATION

ATUL HARIBHAU KACHARE[1], Dr. MUKESH KALLA[2] and Dr. ASHUTOSH GUPTA[3]

[1]Research Scholar, Department of Computer Science & Engineering, Sir Padampat Singhania University, Udaipur, Rajasthan, India.
[2,3]Faculty, Department of Computer Science & Engineering, Sir Padampat Singhania University, Udaipur, Rajasthan, India.
Email: [1]atul.kachare@spsu.ac.in, [2]mukesh.kalla@spsu.ac.in,[3] ashu.gupta@spsu.ac.in

Abstract

Storytelling is a human activity that has been used since ancient times for different purposes and purposes. We generally use story to communicate information, to entertain ourselves, and to teach certain skills. Some of the well-known stories include Beauty and the Beast, The Little Prince, and The Tale of Genji. Storytelling is a very old activity, especially in the developing countries. It's a very common activity for young children. Traditional storytelling has been replaced now by movies and videos as well as television, the online media and different digital media. Nowadays young children can have access to almost any story in every time and area. Storytelling is also used as a tool for education purposes. In schools, storytelling is used in education of children for different purposes such as socialization, communication, and imagination skill development. Storytelling is used to communicate information in a creative manner. However, creating a story based on specific scenario, especially in the field of Computer Vision and Natural Language Processing is still a very challenging problem. Storytelling is a very creative activity and it's different from other activities in the field of Artificial Intelligence. Storytelling is not a task that we can solve with a single automated solution. In this review we have studies various existing systems for story generations developed over the time. We also tried to classify those systems into different categories. We provide a detailed review of existing approaches for automatic story generation that uses the different mechanisms such as Prop Theory, Story Grammar, Computer Vision and Natural Language Processing. Finally, we have concluded some gaps in the re-search in automatic story generation.

Keywords: Storytelling, Natural Language Processing, Prop Theory, Fabula Model

I. INTRODUCTION

A story is the telling of an event, either true or fictional, in such a way that the listener experiences or learns something just by the fact that he heard the story [1]. A short story is a part of writing style literature that usually can be read in single hearing and focusses on a self-controlled affair or string of related happenings, with the intention of inducing a distinct impact or attitude. The short story is one of the eldest types of literature and has existed in the form of icons, epic tales, traditional tales, fairy tales, fables, and narratives in various ancient communities across the world.

Short Story has the oldest history that can find its root in epics such as Mahabharata and Ramayana, etc. But initially short story telling was limited to the Oral story telling which began to develop as the written story telling as the time progresses. Now in the modern era the written story is transformed into the digital story telling which uses the various multimedia.

Normally a story consists of exposition, complication, rising point, crisis, climax, and resolution. But due to limitations of the length and the time of the short story, it may not include

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.7409077

all the factors of the story. In most cases, the short story may include only Complication, Crisis, Climax and Resolution. Also, in the modern stories the sequence could also be altered, for example exposition can be done in the beginning of the middle whenever the characters are introduced in the plot. Even the ending of the short story may be sudden or irrational at several time and may or may not have a moral or rational message.

Story telling intends to prepare the young to educate themselves throughout their lives. It not only helps children to know and learn the words, language and develop literacy skills but also stimulate their curiosity and sparks their imagination. It im-proves the communication, brain, and social skills of the children. It makes them capable of differentiating between real and reel scenarios. It cultivates the strong relationship and ability to recognize the change and upsetting events. Also, it not only improves their vocabulary but also improves their narrative intelligence.

Narrative intelligence is the ability to craft, tell, understand, and respond effectively to stories [2]. It is an important part of human cognition, especially in sense-making and communicating with people. Humans draw on a lifetime of relevant experiences to explain stories, to tell stories, and to help choose the most appropriate actions in real-life settings. The human brain can produce and understand narratives and concepts associated with the stories easily. It is evident from the literature that stories and narrative cognition can play a vital role in learning.

In this article, we have first discussed about the various existing systems that are available for story generation in Section-II. We then examine the exiting approaches used for automatic story generation in the Section-III. Finally, in section IV, we discuss some gaps in research and future research direction, including possible new trends such as amalgamation of visual question answering, concept mapping, etc.

II. EXISTING SYSTEM FOR STORY GENERATION

A. Novel Writer System

Framework Writer by Sheldon (Klein et al. 1973). The Novel Writer System [3] author made the news of the murder in a reunion scene over the weekend. The project is credited with creating "2100 mysteries of mysterious murder, all of which have a significant structure, in less than 19 seconds." An indication of the environment in which the story would require placement was presented as data, next to the contributing personalities. The specific killer and casualty relied upon character characteristics determined as contribution. The intentions emerged as part of the context during the story. Quickly zealous in murder they were compelled to rebel against pleasure, to be powerful, or to be anxious. The story is structured based on two indisputable realities:

- a set of tactics that ascertain the projected break from the world scene to the next
- the recurrent course of action of the story to be reported

The pattern is very fascinating and scrutinizes the development of just a single unambiguous sort of story.

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.7409077

B. Tale-Spin

TALE-SPIN [4] was a way of bringing story about the lives of timberland creatures. To build the story, the animal was given a purpose, which is why the plot was planned to plan the cause. TALESPIN has identified character spaces as career incentives. It has clearly defined the appearance of more than one basic finding in terms of identity in a story, showing records of the unbroken intentions of each of them. Complex relationships between animals were demonstrated. These relationships go almost as a skill in some endeavors and because of others, thus creating a clear flexibility of character support. These characters were demonstrated by levels of compassion, pride, genuineness, and skill.

C. Author

Dehn's AUTHOR [5] was a procedure designed to imitate the author's personality as she builds up a storyline. Dehn's supposition is story spaces are produced by authors as a post hoc hobby for instances that the author has just selected which will be crucial for the story. A writer may have specific objectives as a primary concern when he decides to compose a story, yet regardless of whether he does not, it is acknowledged that various metalevel objectives drive or compel the narrating cycle. There are concerns, for example, assuring that the narrative is coherent, that it is conceivable, that the personalities are sensible, that the prosecutor's expression is hold on across the tale, and so forth. These may decrypt at a smaller level into subgoals be relevant to circumstances into which the originator needs to take the lead a variety of personalities, or the job that certain characters should compete in the story. A story is acknowledged as "the accomplishment of an unpredictable catch of creator plans". These plans add to coordinating the story, and to influencing the progress run.

D. Universe

UNIVERSE [6] was the earliest reciting structure to provide unique introspection about the rendering of personalities. Intricate knowledge formations have been employed to signify them, and a fundamental process was recommended to satisfy.

UNIVERSE was pointed toward investigating expanded story age, a proceeding with chronic as opposed to a story with a start and an end. It was at first planned as an author's guide, with extra wants to later form it into a self-ruling narrator. UNIVERSE inclined to an issue of tactic by creating up a tale about an unreliable world irrespective of whether the situation should be developed first with a plan add-ed a while later, or whether the plan should initiate the progress of the story-world, with characters, ranges and objects being made erratic [7]. Lebowitz proclaimed him-self for the leading choice, which is the reason UNIVERSE included story-world for making characters independently of plot, as contradicted to Dehn, who backed the successive choice.

E. MinstreL

MINSTREL [8] was a program that described tales about Ruler Arthur and his Knights of the Round Table. Every section of the strategy changed on a point that was utilized as a launch to

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.7409077

compose the story. MINSTREL made tales around one-half to one page long. As per its creator, MINSTREL could tally up around ten versions of this length and it could equally make a variety of more constrained story events. MINSTREL utilized development elements incorporating of objectives and policies to accomplish them. These conducted at two individual phases: writer objectives and persona objectives. Story progression in MINSTREL worked as a twin test involving an organizing act and a vital thinking phase which regained understanding from prior stories.

F. Mexica

MEXICA's [9] aim was to replicate the ingenious ride. It was supposed to produce short tales regarding the preliminary occupants of Mexico. During the commitment stage, new story material was logically created, without any limitations forced. Throughout the reflection stage, the established information was re-evaluated to assure that sole obligations have been fulfilled. MEXICA has been a pioneer in that it deemed the passion-ate relationships and struggles between the characters as a way for pushing and re-viewing endless stories.

G. Brutus

BRUTUS [10] was a program that composed short anecdotes about treachery. BRUTUS was fascinating since it put together its narrating capacity with respect to an intelligent model of double-crossing. The magnificence of this model and the elucidations that can be stemmed from it inspired it to make vivid stories. The framework was still anticipated to mull over a substantial heap of testimony about creating and linguistic. BRUTUS have been outfitted for getting an account of great quality, with most of the highlights one would discover in a humanmade story.

H. Prince

This framework [11] is use of the Natural Language Generation. It empowers to communicate the story like a human narrator. It utilizes the calculated portrayal for ex-ample similarity of the story, figure out what is to be told, how it is coordinated, how it is stated, and which feelings relates to each sentence in the last yield. The framework is executed utilizing the cFROG design which is a system library that encourages the development of Natural Language Generation applications.

I. Fabulist

FABULIST [12] was a design for automated narrative creation plus orientation. The FABULIST work separate the story creation gauge into three degrees: fabula production, conversation making, and media depiction [7]. The fabula generation measure utilized an arranging way to deal with story generation. Artificial intelligence organizers are functions that, given a portrayal of a core ailment of the world and a certain objective, recognize the eventual pact of accomplishments to get nearer to goal line. They hook up on considerable representations of the requisites and postconditions of the fair legion of potential endeavors. The choreographing way to pact with account production varies on the assumption that an

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.7409077

accord of activities taking from an fundamental state to a goal is a rational belief of a story. In FABULIST, ideas gave amalgamated an area model depicting the fundamental ailment of the story world, potential activities that can be authorized by characters and a result.

J. Suspenser

Suspenser was a designed for creating a suspense in the narrative. The author has used a three-tier architecture to develop the system which are fabula model, sjuzhet and the discourse. Fabula we can say is initial setup that consist of incidents, personalities, and circumstances in the story. Sjuzhet is a string of phenomena carefully chosen from the fabula in addition to orchestrating those measures signifying the order in which they are to be launched to readers [13]. The final layer discourse is a portrayal method. To summarize the process we can say, Suspenser takes the initial plot as the input, then it selects the set of fundamental actions that has high casual connectivity and then create a partial plan with the help of toxic acts that will exaggerate the suspense of the user. The advantage of using Suspenser is that it can be fruitful with fabula generator such as IPOCL which generates a tale that is coherent with each charisma's aim or CPOCL that recommends a story concerning dispute. The deficiency of Suspenser is that it cannot put in up a clean narrative matter that is not appear in the fabula [13].

III. REVIEW OF LITERATURE

Charles F. et. al. [14] used the interactive story building approach by focusing on the behavioral aspects of the story characters. Authors were able to produce the variation due to the actor interaction. Due to character centered approach system became modular and can be extended to many actors. The decision is influenced by the human intervention. Due to such interventions, there will be large amount of unpredictability in the story.

Cavazza, M. et. al. [15] used a Hierarchical Task Network. Their objectives were to make story interactive and achieve variability while preserving a well-defined story genre. This objective was achieved by making alteration in the plot by changing environment. Author has used situation reasoning & action-repair mechanism to avoid unplanned consequences. The limitation of the system was limited number of plans for the users. Also, the variability in the story is totally depends upon how the user perceive the story plot.

Gervás, P. et. al. [16] aimed to develop a system for automatic story generation that reuse existing stories using Case Based Reasoning Structure with Ontology and NLG Technique. An ontology Structure was developed based on the Propp Theory which holds the various concepts thar are relevant to story generation. Cases are design using CBR and Domain Ontology. Depending on the input a particular case will be retrieved from the CBR and using NLG we can construct the story. The selected case structure i.e., plot will act as an input along with character function.

Aikawa T. et. al. [17] provided the direct visual output to the user in response to their natural language input. The architecture is divides into two different blocks viz. NLP Component & Graphics Component. NLP Component takes the input line and analyze it to find various

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.7409077

factors that Graphics Component will require to build the appropriate animated graphics. The biggest drawback of the system is that it does not consider the linguistic analysis of the input. Also, there is default images for different characters and multiple actors with same names are also not possible.

Jaya A. et. al. [18] focused on the automatic sentence generation using the ontology. It uses the ontology & language grammar to from the sentence for the story generation. The whole process is sub divided into three parts which are content determination, sentence planning and realization. In content determination it decides what should be said and in what structure. Here we can identify the theme, characters, and tense of the sentence. In the second step decision is taken regarding the splitting of sentences, usage of nouns & pronouns and discourse. In realization, it generates the proper sentence adhere to the language grammar with the help of the ontology which provide the domain knowledge essential for semantics.

Bui, V. et. al. [19] proposed a computational framework to develop a regular grammar for automated story-based scenario generation using evolutionary genetic algorithm. They performed an experimental study on 20 variable length randomly selected individuals. The length varies from 10 to 30. Then population was evolved for 100 generations. A binary tournament selection was used as fitness function. Fitness of each final generated plot was analyzed using four criteria, Coherence, Consistence, Novelty & Creativity, and Interestingness. The result obtained were promising by the evolutionary algorithm. But with the help regular grammar we could only generate the simple stories due to limited dependency in the production rule. Also, the evolution process is completely human based.

Porteous J. et. al. [20] tried to how the use of state constraints can provide a unified perspective on how best to control the shape of the narrative that is generated. They used a State Trajectory Constraint to show the result. They represented Narrative control knowledge for a given story world using state trajectory constraints and then used these state constraints as landmarks and to use them to decompose narrative generation. This approach to narrative generation is fully implemented in an interactive narrative based on the “Merchant of Venice.”

Imabuchi S. et. al. [21] proposed a method that used the Propp Theory, Conceptual dictionary, procedural modules & story Grammar. With the modification of story grammar author were able to bring diversity & variation in story line. The proposed method cannot be generalized due to binding with Propp Theory. Also, there is limitations on the passage of actor's movement.

Jaya, A. et. al. [22] tried to develop a new story generator that can have a computational representation & semantic reasoning. Instead of using basic 31 prop functions, author has revised the system and use 5 key functions to generate the story. The quality of the stories was improved because of semantic checking. Also, it can be observed that the first order logic & ontology are fundamental elements in semantic reasoning. The semantic reasoner also enforces the consistency & subsumption checking & restrictions using ontology. Further we could use the NLG to improve sentence.

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.7409077

Imabuchi S. et. al. [23] used the Propp model, story grammar, knowledgebase and large conceptual dictionary for noun and verbs to build the narrative for the interactive games. They were able to generate the different stories with the help of input function and various sub-functions which are different than prop theory. The method can be used to generate a micro level details enabling to be the part of future computer games.

Swanson R. et. al. [24] proposed a method to produce coherent and entertaining stories using supervised classification approach. The system architecture was consisting of 4 components which are, a case library of previously solved problems, a retrieval mechanism, an adaptation component for modification, an ability to reuse the learned knowledge. The adaptation module was the heart of the system which was consisting 5 different steps which were rule based.

- Identify all names and proper names from the parse tree.
- Generating a new sentence for a subset of every possible combination of the replacements in each target word set.
- Lexical and syntax adjustment of previous step
- Preserve the coreference interpretation
- Rank the two-best alternative of adaptation process with unaltered sentence.

Akimoto T. et. al. [25] used of two different phenomenon which is Macro Level story technique and Micro Level Story technique. Macrolevel story technique is same as Propp Theory based technique which gives the overall story structure and Microlevel story techniques it gives the detailing of the larger events using the cause-effect relation or script relation. There can be semantic gap between the two different events in the macro techniques whereas micro techniques work only as filler in the gaps.

Ware S. et. al. [26] the conflict as an interesting part of story using the POCL planner & Algorithm. They defined 7 different dimensions of conflict. The first three conflict, participants, reason, and duration are discrete values. The next four are balance, directness, stakes, and resolution which are continuous values representing the narrative properties. They also performed two different experiments to study both the classes of dimensions. The experiment clearly highlights the limitations of POCL due to its close binding with the fabula model.

Colon R. S. et. al. [27] tried to imitate the human behavior of writing stories using Propp using Internet & existing knowledge system such as wordnet, conceptnet and iterative approach is used to generate the final story. Stories generated were random in nature as no initial knowledge was provided but it a new question was raised, “Is narrative cohesive?”.

Bernardi R. et. al. [28] classified the existing automatic description generation approaches in three different categories which are Direct generation, Retrieval Problem using either visual space or multimodal space. In direct generation, first content information (objects, attributes, scene types & actions) is predicted or detected and then used to generate the descriptor. In visual space retrieval, the model fist search for the similar images in the dataset and then

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.7409077

generate the descriptors with the help of reusing the descriptors of similar images. The multimodal space uses images and text both for generation of descriptors. They also suggested different methods used for NLG in previous approaches such as either n-gram based, entropy based, fix structure, RNN and other more sophisticated linguistic approaches, etc.

Mehta A. et. al. [29] used the trainable NLG along with the ranking methodology. It works in three different phases which are content selection, sentence planning and surface realization. Depending upon ranking algorithm the final sentence can be selected. But while realization there are some assumptions are made which limits the output such as tense will be always a present tense, singular entities and article always precedes those.

Soo V. W. et. al. [30] used the Monte Carlo Tree to find a feasible sequence of the events using Fabula model in the common-sense knowledge base generated by Conceptnet. The pre-requisite was that the user should be aware with the initial and goal concept and the desired length of the story for generation. Concepts are extracted from the conceptnet and mapped to causal relationship as per the Fabula model. As the knowledge base is lower for internal element and goal, stories were having lesser emotion. The ambiguity of the conceptnet was also one of the difficulties in such a system.

Marta Vicente et. al. [31] proved that macroplanning and surface realization are the important in Natural Language Generation. They used the Positional Language Model (PLM) and Factored Language Model (FLM) for macroplanning and Surface realization, respectively. To prove his point, author carried out the experiment using the Bedtime stories dataset. Due to the combination of the Macroplanning and Surface realization author was able to regenerate the story or recreate the story.

Wang K. et. al. [21] transformed a story composed in English into an incident point and tiered-level syntax using a network interpretation with the help of evolutionary algorithm. Authors have designed an encoding scheme that convert the story narration with the flashback in the chromosomes and then evolutionary algorithm is applied. They used 7 different types of evaluation metrics out of which 3 are subjective such as, coherence, novelty, and interestingness and 4 are objective which are distance of flashback, consistency of chain order, participants arrangement and their role arrangement. Then experiment was performed by selecting 42 different humans for the evaluation from the age group of 20 to 30. With the human evaluation authors were able to find the correlation between the different metrics used by them. With the help of above results authors have proposed a surrogate model that uses the result of above study and again the experiment is performed using the fitness function defined in above experiment which found more suitable.

Pradyumna Tambwekar et. al. [33] used the reinforcement learning to provide the feedback to the system and to generate the more coherent stories as per the user's goal requirement. Authors carried experiment to prove their method where they used 175 participants for evaluation with 9 different parameters such as Grammar, Sense, repetition, interestingness, etc. Authors carried experiments on three different conditions which are using seq2seq vectors, DRL with clustered and unrestricted approach. Stories generated using DRL approach found to be more consistent

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.7409077

towards the goal i.e., almost 93%. Furthermore, the DRL technique improves perplexity when generated plots are compared to the testing corpus.

Seraphina Goldfarb-Tarrant et.al. [34] studied different levels of interactions such as in story writing, story planning and diversity control of human intervention. They suggested that human-computer collaboration improves the quality of the story at all the different metrics. To support their claim authors has carried a case study where they compared different variations which are Machine Only, Diversity Only, Storyline Only, Story Only, Turn-taking and All. From the experimental study it can be observed that casual –temporal coherence can be introduced with the human collaboration.

Hsu C. C et. al. [35] proposed another interactive approach of the digital storytelling. The system takes series of photos as a sequence and then find some term related to them which are further used to generate the short story after human inspection on the terms. It uses a trained model knowledge set to build the context-coherent story. The limitation can be there is too much control with the human for the term selection.

Angela Fan et. al. [36] studied structural model by decomposing stories by isolating over actions and entities using deep convolution network as both encoder and decoder. Conditioned upon the prompt, author generate sequences of predicates and arguments. Then, a story is generated with placeholder entities such as ent0. Finally, replace the placeholders with specific references. Authors has compared their stories with different approaches such as summarization, keyword extraction, Sentence compression, Semantic Role Labelling (SRL), SRL+NER and SRL + Coreference resolution which overcomes the other.

Yao L. et. al. [37] compared dynamic and static planning strategies for story generation. They used RNN for Dynamic strategy and LSTM for static strategy. The dynamic outline intermingles story preparing and its face recognition in text while the stagnant schema plots out the complete plot before producing stories. Authors performed the experimental study on the ROC Stories dataset. With the result it can be noticed that with clear plot development, the produced stories are more distinct, coherent, and on the theme [38].

Leon C. et. al. [39] studied the cognitive model and its implication in the automatic story generation system. They examined what modifications human participants apply on an evolving draft. Not only the high-level cognitive tasks are observed, but also what elements are added or removed from the draft. By doing this, they expect to provide additional insight to computational cognitive models through the identification of the objects to be included. They carried out the experimental study using the 14 different persons including 4 females ranging from 19 to 41 from the education fraternity. The experiment was divided into 4 steps, first is writing a story in 10 min, secondly type the story in words including some modification if wants not changing the structure, again modify the story on paper withing 10 min including a new prominent character and lastly to write story on word again. After the process feedback was taken in the questionnaire format for evaluation.

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.7409077

Also, the whole session was recorded and then annotated. Following conclusion drawn from the experiment:

- Most of the main ideas are conceived at the beginning
- Most of the operations happen at the level of characters and actions & places and moments in a lesser
- The characters have different relevance, and the protagonist is created first.
- Plot elements are created during story conception and during discourse creation.

Issa L. et. al. [40] divided the work mainly into two phase which are planning & building to generate the framework for educational stories. They used the ontology structure, HMM Model and NLG for story generation. Initially authors have suggested two different forms of the system depending upon the literature survey one which give structure and other which give the complete story. With the help of the ontology, it was easier to setup the story platform and HMM model was more convenient in planning the sequence of the events to generate the plot.

Wang L. et. al. [41] builds a system that can generate the sentence from the quick drawing and convert them to the stories using RNN. Quick drawing was converted into features using RES-net. The features generated from RES-net were utilized to convert into sentence using Transformer model. The generative pre-trained model is used to generate the stories from sentences with the help of ROC Stories.

Lin J. W. et. al. [42] proposed a system where freedom was provided to the user to decide which content the machine is to narrate, and the user can just give a summary to generate the complete paragraph. Authors proposed a combination of syntax guided machine reading comprehension (SG-net) and semi-supervised self-growing generative adversarial network (SG-GAN) using attention mechanism. From the experimental setup, it is observed that both SG-net and SG-GAN can understand basic semantic and grammar and can write a readable article. Also, we can conclude SG-GAN is more effective in understand the semantic and grammar than SG-net which only recite the statement that have been read. The disadvantage of the system is that we need large amount of data for the training.

Liu H. et. al. [43] proposed a theoretical framework that uses the combinational and the transformational rules together to generate new ideas and provide potential options in film-story creation. The framework consists of a movie knowledge library, an ingenious computer system, an evaluation model, and an output module. The mixture of creative computing and film story creation not only helps to supply novel storylines, shorten the creation cycle, and speed up movie industry, but also contributes to the novelty and specificity of interdisciplinary studies.

Cantoni R. et. al. [44] used Propp model and Fabula model with large knowledgebase to generate automatic story for the games given the sequence of events as input. The system is basically divided into two parts which are plot and text generation. The system was able to generate the coherent, believable story that mainly revolve around a single character. Though

ISSN 1533-9211

DOI 10.5281/zenodo.7409077

the complete process was automated it was mainly depending upon the information provided at the setup time such as a set of scenes, a probabilistic graph stricture for each scene & proper logic rules and text dictionary.

Chen G. et. al. [45] proposed a method that generate the outline from the training data having title and story and then use the outline to fill the information gap between title and story to produce the larger stories using variational neural network and summarization model to generate the stories. In variational neural network instead of discrete author has used continuous values. Experimental study was performed on the ROCStories and VIST dataset. The Latent variable model was compared with previous five models which are, Direct, Skeleton, Hierarchical, Separate and Planned model. The latent module outperformed all other methods. The same model can be extended further to generate the longer stories using multiple outlines.

Guan J. et. al. [46] generated reasonable stories that address the issue of repetition, logic conflicts, and lack of long-range coherence. Authors propose a knowledge-enhanced pretraining model for commonsense story generation by extending GPT-2 with external commonsense knowledge. The model is post-trained on the knowledge examples constructed from ConceptNet and ATOMIC. They adopted a classification task to distinguish true stories from auto-constructed fake stories. The auxiliary task makes the model implicitly capture the causal, temporal dependencies between sentences and inter-sentence coherence, and lead to less repetition. Even extensive experiments with automatic and manual evaluation were conducted which indicates that paradigm can spawn farther realistic stories than robust baselines, especially in terms of inevitability and global lucidity [47].

IV. CONCLUSION & FUTURE SCOPE

So, from above literature we can say that there is large improvement has happened in the story generation field from the oldest system till the current advancement. Now we could use a computer to create a good story but still it is not able to match the task of human narrator in case of coherency, suspense, etc. The various existing system which we have seen uses the different approaches to implement the task. For example, The Novel Writer, TELE-SPIN, AUTHOR, MINSTREL, MEXICA, FABULIST and SUSPENSER uses the planning as one of the types where the input such as characters their actions, and the environment or initial plot is taken over which story can be built as a sequence of events. Another approach is that they used an available resource to construct a story like Story Grammar to generate the stories such as Novel Writer or BRUTUS. At the same time some system used previously generated story to write a better next time such as UNIVERSE, MEXICA, etc. But one thing is evident from the literature study is that, either most of the system follows either the Propp Model or Fabula model or combination of both, or most of the system focus on a single character and there is no guarantee that the story generated could be a semantically correct and believable. Also, most of the stories requires the skeleton to be provided and then they improve on the given input plot. This can be improved if use Visual Question Generation method as input instead of giving complete initial plot but provide an image input, adding domain knowledge with inception of

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.7409077

Concept maps and using the advancements of Natural Language Generation to generate the free-flowing story.

References

1. Dictionary.com, https://www.dictionary.com/browse/story, Last accessed 2021/02/09.
2. Li, B., "Learning knowledge to support domain-independent narrative intelligence," PhD diss., Georgia Institute of Technology, 2015.
3. Klein, S, "Automatic novel writing: A status report," University of Wisconsin-Madison Department of Computer Sciences, 1973.
4. Meehan, J. R., "TALE-SPIN: An Interactive Program that Writes Stories," International Joint Conferences on Artificial Intelligence, Vol. 77, 1977, pp. 91-98.
5. Dehn, N.," Story Generation After TALE-SPIN," International Joint Conferences on Artificial Intelligence, Vol. 81,1981, pp. 16-18.
6. Lebowitz, M.," Creating characters in a story-telling universe," Poetics, 133, 1984, pp.171-194.
7. Gervás, P.," Computational approaches to storytelling and creativity," AI Magazine 30, no. 3, 2009, pp. 49-49.
8. Turner, S. R.," MINSTREL: A computer model of creativity and storytelling," University of California at Los Angeles, Computer Science Department, 1994.
9. y Pérez, Rafael Pérez.," MEXICA: A computer model of creativity in writing," Norman Spinrad, 1999.
10. Bringsjord, S., Ferrucci, D.," Artificial intelligence and literary creativity: Inside the mind of brutus, a storytelling machine.," Psychology Press, 1999.
11. Hervás, R., Francisco P.," Cross-domain analogy in automated text generation," In Proceedings of the Third joint workshop on Computational Creativity, ECAI, vol. 6. 2006.
12. Riedl, Mark O.," Narrative planning: Balancing plot and character," Journal of Artificial Intelligence Research 39, 2010, 217-268.
13. Cheong, Y. G.," Suspenser: A story generation system for suspense," IEEE Transactions on Computational Intelligence and AI in Games 7, no. 1, 2014, 39-52.
14. Charles, F., Steven J. M.," Character-driven story generation in interactive storytelling," In Proceedings Seventh International Conference on Virtual Systems and Multimedia, 2001, pp. 609-615.
15. Cavazza, M.," Character-based interactive storytelling," IEEE Intelligent systems 17, no. 4, 2002, pp.17-24.
16. Gervás, P., Díaz-Agudo, B.," Story plot generation based on CBR," In International Conference on Innovative Techniques and Applications of Artificial Intelligence, Springer, London, 2004, pp. 33-46.
17. Aikawa, T., Schwartz, L.," NLP Story Maker," Microsoft Research, 2005.
18. Jaya, A., Uma, G. V.," A novel approach for construction of sentences for automatic story generation using ontology," In 2008 International Conference on Computing, Communication and Networking, IEEE, 2008, pp. 1-4.
19. Bui, V., Hussein, A.," Evolving stories," Grammar evolution for automatic plot generation," In IEEE Congress on Evolutionary Computation, IEEE, 2010, pp. 1-8.
20. Porteous, J.," Applying planning to interactive storytelling: Narrative control using state constraints," ACM Transactions on Intelligent Systems and Technology TIST 1, no. 2, 2010, pp. 1-21.

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.7409077

21. Imabuchi, S., Takashi, O.," A story generation system based on Propp combined with a conceptual dictionary," In 2011 7th International Conference on Natural Language Processing and Knowledge Engineering, IEEE, 2011, pp. 359-362.
22. Jaya, A., Uma. G. V.," An Intelligent Automatic Story Generation System by Revising Proppian's System," In International Conference on Computer Science and Information Technology, Springer, Berlin, Heidelberg, 2011, pp. 594-603.
23. Imabuchi, S., Takashi, O.," A story generation system based on Propp theory: As a mechanism in an integrated narrative generation system," In International Conference on NLP, Springer, Berlin, Heidelberg, 2012, pp. 312-321.
24. Swanson, R.," Say anything," Using textual case-based reasoning to enable open-domain interactive storytelling," ACM Transactions on Interactive Intelligent Systems TiiS 2, no. 3, 2012 pp. 1-35.
25. Akimoto, T., Imabuchi, S.," A story generation mechanism based on the cooperation of micro/macro story techniques," As a module in the integrated narrative generation system," In 2013 IEEE/ACIS 12th International Conference on Computer and Information Science ICIS, IEEE, 2013, pp. 377-384.
26. Ware, S.G., Young, R. M..," A computational model of plan-based narrative conflict at the fabula level," IEEE Transactions on Computational Intelligence and AI in Games 6, no. 3, 2013 pp.271-288.
27. Colon, R. S., Patra, P. K.," Random word retrieval for automatic story generation," In Proceedings of the 2014 Zone 1 Conference of the American Society for Engineering Education, IEEE, 2014, pp. 1-6.
28. Bernardi, R.," Automatic description generation from images: A survey of models, datasets, and evaluation measures," Journal of Artificial Intelligence Research 55, 2016, pp.409-442.
29. Mehta, A., Gala R.," A roadmap to auto story generation," In 2016 3rd International Conference on Computing for Sustainable Global Development INDIACom, IEEE, 2016, pp. 2306-2310.
30. Soo, V.W., Chen T. H.," Generate Causal Story Plots by Monte Carlo Tree Search Based on Common Sense Ontology," In 2016 Joint 8th International Conference on Soft Computing and Intelligent Systems SCIS and 17th International Symposium on Advanced Intelligent Systems ISIS, IEEE, 2016, pp. 610-615.
31. Vicente, M., Barros C.," A Study on Flexibility in Natural Language Generation Through a Statistical Approach to Story Generation," In International Conference on Applications of Natural Language to Information Systems, Springer, Cham, 2017, pp. 492-498.
32. Wang, K.," Human-guided evolutionary story narration. IEEE Access 6, 2018, pp.13783-13802.
33. Tambwekar, P., Dhuliawala, M.," Controllable neural story plot generation via reinforcement learning," 2018, arXiv preprint arXiv:1809.10736.
34. Goldfarb-Tarrant, S., Feng, H.," Plan write and revise: an interactive system for open-domain story generation," Proceeding of Conference of North America Chapter Association Computer Linguistics: Human Language Technology, Minneapolis, Minnesota, 2019, pp. 89-97.
35. Hsu, C. C., Chen Y. H.," Dixit," Interactive Visual Storytelling via Term Manipulation," In The World Wide Web Conference, 2019, pp. 3531-3535.
36. Hou, C., Chensong Z.," A survey of deep learning applied to story generation," In International Conference on Smart Computing and Communication, Springer, Cham, 2019, pp. 1-10.
37. Fan, A., Lewis, M.," Strategies for Structuring Story Generation," Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics, Florence, Italy, July 2019 pp. 2650-2660.
38. Yao, L., Peng, N.," Plan-and-write: Towards better automatic storytelling," In Proceedings of the AAAI Conference on Artificial Intelligence, vol. 33, no. 01, 2019, pp. 7378-7385.

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.7409077

39. Leon, C.," Empirical Insights into Short Story Draft Construction," IEEE Access 7, 2019, pp.119192-119208.
40. Issa, L., Jusoh, S.," Applying ontology in computational creativity approach for generating a story," In 2019 2nd International Conference on new Trends in Computing Sciences ICTCS, IEEE, 2019, pp. 1-6.
41. Wang, L., Qin, S.," From Quick-draw To Story: A Story Generation System for Kids' Robot," In 2019 IEEE International Conference on Robotics and Biomimetics ROBIO, IEEE, 2019, pp. 1941-1946.
42. Lin, J. W., Tseng, T. H.," Chinese Story Generation Using Conditional Generative Adversarial Network," In 2020 International Conference on Artificial Intelligence in Information and Communication ICAIIC, IEEE, 2020, pp. 457-462.
43. Liu, H. W..," A Creative Computing Approach to Film-story Creation: A Proposed Theoretical Framework," International Journal of Automation and Computing 17, no. 5, 2020, pp.678-690.
44. Cantoni, R., Essenziale, J," Procedural constrained story generation based on Propp's and Fabula models," In 2020 IEEE 8th International Conference on Serious Games and Applications for Health SeGAH, pp. 1-8.
45. Chen, G.," Learning to Generate Explainable Plots for Neural Story Generation. IEEE/ACM Transactions on Audio, Speech, and Language Processing 2020.
46. Guan, J.," A knowledge-enhanced pretraining model for commonsense story generation," Transactions of the Association for Computational Linguistics 8, 2020, pp.93-108.
47. Herrera-González, B. D., Gelbukh, A.," Automatic Story Generation: State of the Art and Recent Trends," In Mexican International Conference on Artificial Intelligence, Springer, Cham, 2020, pp. 81-91.