



Hero's Journey as a Lattice Structure: A Case Study of Star Wars

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ABSTRACT

Storytelling is one of the oldest human activities for sharing information, entertainment, etc., and it is not wrong to say that myths were the most common form of storytelling through all ages in all cultures. Thanks to the researchers starting with Adolf Bastian and followed by Carl Gustav Jung and Joseph Campbell we now know that there is a common structure in myths regardless the cultural environment they are told in. Among the monomyths of Jung maybe the most interesting one is the hero and, as Campbell showed in "The Hero with a Thousand Faces", his journey. Crucially, the hero's journey is not only a spatial journey but also a temporal one. The aim of this paper is to show that the temporal journey of the hero in the film series Star Wars, Episode IV-VI, can be organized into a fractal-lattice structure. The lattice-based framework presented here can serve as a formal foundation for an automated storytelling engine to be used in various areas like computer games, interactive books, e-learning, etc.

Keywords: Automated storytelling, Fractal lattice, Hero's journey.

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I. Introduction

Communication has always been a crucial and essential element in the life of human being. It is, of course, natural language that is the primary medium of communication. First in spoken then both in spoken and written form, language has shaped individuals and cultures and also the interrelationships between individuals and cultures. Furthermore, language can even be thought of as the primary tool for creating cultures. One of the most ancient forms of language usage is storytelling. Storytelling has appeared in various styles. It is not wrong to say that the most common of these styles is myths. Seeing the variety and richness of cultures, the main question is whether there are some common structures underlying all of these myths or not. This question aroused at the end of the 19th Century especially in the works of the German scientist Adolf Bastian. He was the first who proposed the idea that myths from all over the world seem to be built from the same "elementary ideas", e.g. in (Bastian, 1880). In the beginning of the 20th Century Sigmund Freud, the founder of the school of psychoanalytic, proved that there is a common thinking and behaving structure within an individual. Coarsely speaking, Freud treated the individual as a conglomerate of consciousness and unconsciousness (Freud, 1899; Freud, 1923). All these

and other works at the dawn of the 20th Century assumed and showed that there are common structures in the thinking and acting of human beings. It was Carl Gustav Jung's merit to demonstrate that this thought of common structures and the idea of unconsciousness do not apply only to individuals but to the human species as "collective unconsciousness" (Jung, 1902). In contrast to Freud, Jung showed that there are common structures for collective unconsciousness and that collective unconsciousness shows up in the form of myths. The common structures are called "archetypes" or "monomyths" (Jung, 2014). He claimed and showed that archetypes build the basis of human psyche but not confined to it. Here is a non-exhaustive list of archetypes: the Mother, the Child, the Shadow, the Persona, Anima and Animus, the Father, the Hero, the Virgin, the Wise Old Man, the Animal, the Swindler, the Hermaphrodite and, of course, the Self.

As these structures are common to all cultures, we believe, these structures lend themselves very well to formalization. Such kind of formalization might help to construct automated methods for all areas of storytelling with the assistance of computer technologies. Of course, it is a bold venture to claim that all the archetypes could be formalized very easily. Therefore, in this paper we will concentrate on The Hero which is one of the most widely used archetypes not only in modern cultural products like computer games, novels or films etc. but

also in older ones like religious stories and/or myths, etc.

The remainder of this paper is organized as follows. Section II deals with the background of the work including an introduction to the hero's journey, the films of the Star Wars series, namely Episodes IV-VI as examples of very good implementations of the hero's journey and the lattice of semantic roles. Section III will describe the hero's journey as a lattice structure by explaining the temporal ground for the journey and showing distinct but similarly-structured figural situations. The paper culminates with a conclusion and some suggestions for future work.

II. Background

a. Hero's journey

Although all archetypes are found in myths, maybe the most interesting and used archetype is the hero. The hero as an archetype is extensively used in modern cultural products like films, computer games, etc. The hero is often naïve, not to say stupid. Nonetheless, since the archetype Hero is closely bounded to the archetype Self, people can easily identify themselves with the hero.

The archetype Hero is best examined in the groundbreaking work of Joseph Campbell, "The Hero with a Thousand Faces" published in 1949 (Campbell, 1949). Strongly influenced by Jung's ideas of archetypes, Campbell starts with showing the relationship and the analogies between myths and dreams. With extensive comparative studies between many different cultures and also religions, Campbell shows that the hero is in an ongoing transition from being nobody to the saviour thorough a period of time involving his concerns about and struggles against his own weaknesses. As going into the details of each step in the advancements of the Hero's Journey would take us beyond the scope of this work, we will content ourselves with giving a brief overview of the journey's steps. The Journey is separated into three acts and seventeen (17) steps, which are intertwined as below.

Act I: Departure

1. The Call to Adventure: The hero is invited or called to adventure/quest mostly by a messenger or event.
2. Refusal of the Call: At first the hero refuses the call to adventure or quest. S/he has to suffer or be in agony. So, s/he accepts the mission at the end.
3. Supernatural Aid: After accepting the mission / adventure / quest the Hero meets his / her mentor or the wise man / woman. The wise person teaches him / her, gives him / her a talisman, a magic or weapons if needed and trains the Hero so that s/he gets all attributes / characteristics to complete the mission successfully.
4. Crossing the Threshold: The Hero crosses the first threshold and leaves the known world behind him / her and enters the unknown world of the adventure / mission. From this point on there is no turning back.
5. Belly of the Whale: The entrance to the new world can be like a new birth. The hero experiences a

severe transition like death or death-like situation. After this experience, s/he is now ready for the mission / adventure.

Act II: Initiation

6. The Road of Trials: With the help of the mentor or using his / her new abilities / characteristics, the hero overcomes small tasks in the new world and expands his / her abilities.
7. The Meeting with the Goddess: If the hero is a male, he meets generally a goddess or a noble female like a queen or princess and unites with her. This is the Oedipus part of the personal unconsciousness of Freud. In case the hero is a female, the same process applies to her too but with the difference that she unites with a God, a male partner. The symbiosis of the genders represents the perfectness.
8. Woman as Temptress: The Hero is being tested by 'carnal' desires during his / her journey all the time. Only with the sexual union with the earth mother can he / she defeat these desires and get victorious.
9. Atonement with the Father: The hatred against the father, which is another essential part of the Oedipus complex, can be overcome at this stage by accepting the forgiving (albeit, sometimes ugly) father and also being forgiven by the creator father. This helps the Hero also to understand his / her role and gain deeper knowledge about him / herself.
10. Apotheosis: The hero's perception and consciousness reaches the top level. New abilities and characteristics are offered to him / her and s/he starts to see the reality in a different way. The hero becomes a kind of god.
11. The Ultimate Boon: Now the hero is ready to accomplish his / her goal in a way that his / her former world also benefits from it.

Act III: Return

12. Refusal of Return: The hero refuses to get back to his / her former world because s/he indigenizes or loves the new world or his / her new identity much more.
13. The Magic Flight: When the advances or the return faces some resistance, suddenly magic barriers / obstacles appear.
14. Rescue from Without: The Hero starts to question his / her advances / gains or loses his / her ego. For similar reasons, s/he becomes unbelieving. At this point s/he needs help from his / her previous world.
15. The Crossing of the Return Threshold: The hero accepts the fact that the "ordinary" world is his/her reality and has to leave his/her superior powers back.
16. Master of Two Worlds: The hero has both the abilities and characteristics of the human-carnal and divine-fantastic worlds.
17. Freedom to Live: The hero spreads his / her achievements and mercy all over the world and, in

this way, shares them with the whole world.

For the modern storytelling, Christopher Vogler made some changes on the overall structure of Campbell's Hero's Journey and proposed a 12-step system again subdivided into three acts (Vogler, 2007) as can be seen in Table I.

TABLE I
CAMPBELL'S AND VOGLER'S HERO'S JOURNEY

Act	Campbell (1949)	Vogler (2007)
I. Departure	1. The Call to Adventure	1. The Ordinary World
	2. Refusal of the Call	2. The Call to Adventure
	3. Supernatural Aid	3. Refusal of the Call
	4. Crossing the Threshold	4. Meeting with the Mentor
	5. Belly of the Whale	5. Crossing the Threshold to the Special World
II. Initiation	6. The Road of Trials	6. Tests, Allies and Enemies
	7. The Meeting with the Goddess	7. Approach to the Innermost Cave
	8. Woman as Temptress	8. The Ordeal
	9. Atonement with the Father	9. Reward
	10. Apotheosis	
III. Return	11. The Ultimate Boon	10. The Road Back
	12. Refusal of the Return	11. The Resurrection
	13. The Magic Flight	12. Return with the Elixir
	14. Rescue from Without	
	15. The Crossing of the Return Threshold	
	16. Master of Two Worlds	
	17. Freedom to Live	

One of the most successful implementations and applications of the Hero's Journey is the film series Star Wars created, produced and partly directed by George Lucas. The series has been produced as two trilogies and in both trilogies the Hero's Journey is told with two different endings. As the films are well-known, here it suffices to touch upon them en passant. This study is concerned with the Episodes IV-VI from the years 1977, 1980, and 1983. In these films, the hero is Luke Skywalker. The main events in his journey can be mapped onto Campbell's structure as in Table II:

TABLE II
LUKE SKYWALKER'S JOURNEY

Act	Campbell (1949)	Star Wars (1977, 1980, 1983)
I. Departure	1. The Call to Adventure	1. Princess Leia's message
	2. Refusal of the Call	2. Must help with the harvest
	3. Supernatural Aid	3. Obi-wan rescues Luke from sandpeople
	4. Crossing the Threshold	4. Escaping Tatooine
	5. Belly of the Whale	5. Trash compactor
II. Initiation	6. The Road of Trials	6. Lightsaber practice
	7. The Meeting with the Goddess	7. Princess Leia (wearing white)
	8. Woman as Temptress	8. Luke is tempted by the Dark Side
	9. Atonement with the Father	9. Darth Vader and Luke reconcile
	10. Apotheosis	10. Luke becomes a Jedi
	11. The Ultimate	11. Death Star destroyed

	Boon	
III. Return	12. Refusal of the Return	12. Luke wants to stay to avenge Obi-Wan
	13. The Magic Flight	13. Millennium Falcon
	14. Rescue from Without	14. Han Solo saves Luke from Darth Vader
	15. The Crossing of the Return Threshold	15. Millennium Falcon destroys pursuing TIE fighters
	16. Master of Two Worlds	16. Victory ceremony
	17. Freedom to Live	17. Rebellion is victorious over Empire

b. The lattice of semantic roles

Kılıçaslan & Tuna (2015) propose to partition the spatial semantic domain into three fields: the locative field, the figural field, and the psychological field. They rest this tri-partition on a well-known principle of the Gestalt school of psychology: a human perceiver automatically segregates a scene into a figure and a ground, with the former standing out against the latter. The locative and figural fields come, respectively, from the ground and the figure; and, the perceptual field corresponds to the mind of the perceiver.

The locative field is the field of entities being in motion or located somewhere. Thus, it involves the following thematic roles: Location, Source, Goal, and Path. It is argued that Source, Goal, and Path are all to be taken as Locations, as they refer to the places where moving entities are located at the beginning, at the end and throughout their motions. Furthermore, Paths are considered as both a Source and a Goal: a path is a goal at the beginning of a motion and it is a source at the end. Figure 1 is a lattice representation of the described is-a relations among the locative roles:

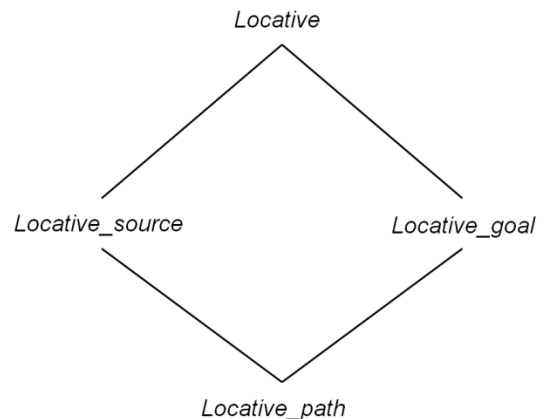


Fig. 1. The is-a relations among the locative roles

The figural field involves the following roles: Theme, Actor, Patient, and Instrument. Each figural role points to an entity that is located somewhere. This common property of the figural roles (i.e., being located in a place) is captured by specifying each of them as Figural. A Theme is merely Figural. An Actor is a Figural_source as it is the source of action. A Patient is a Figural_goal as it is the goal of action. An Instrument is a Figural_path through which action flows from the Figural_source to the Figural_goal. Therefore, the is-a relations among the figural roles can be described as in Fig. 2.

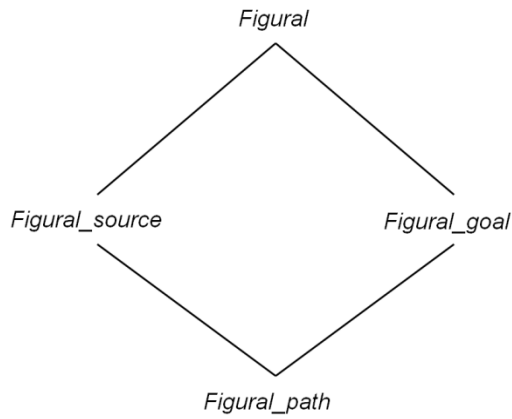


Fig. 2. The is-a relations among the figural roles

Kılıçaslan & Tuna suggest that the psychological field can be given a similar treatment. A perceiver’s mind is a location for information, as is the case in a mental situation described by the sentence “John knows that the earth is flat.” When information is a ‘theme’ of an ‘abstract transition’, as is the case in Gruber’s (Gruber, 1993) following example: “John learned that the earth was flat from Bill.” Paraphrasing this example as “The information that the earth was flat ‘moved’ from a source (Bill’s mind) to a goal (John’s mind),” they propose to add the roles Psychological_source and Psychological_goal to the inventory of thematic roles. They also argue that a notion of Psychological_path is needed, because the sense organs can be thought of as ‘paths’ through which information flows (from a situation) to one’s mind. The diagram in Fig. 3 represents the lattice organization of the psychological field.

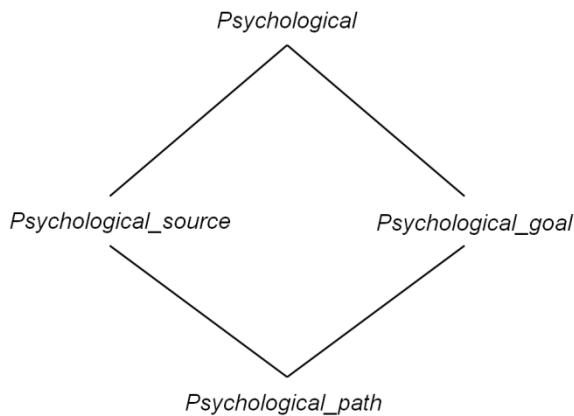


Fig. 3. The hierarchical organization of the psychological field

In this paper, we propose that Kılıçaslan & Tuna’s tripartite treatment of the spatial semantic domain can be applied to the temporal semantic domain. Notice that there is a common structure that cuts across all three fields: everything is a location and paths are both sources and goals. Similarly, time can be considered as a location for situations. When we say that an event occurred in a particular year, we consider that year to be the temporal location of that event. When we say “John has been sleeping since 9 in the morning,” we take a point in time as a temporal source; or, when we say “John will stay

awake until the noon,” we consider a point in time to be a temporal goal. Besides, when we say “Xmas is approaching”, we take the timeline as a path along which an event moves. Moreover, just as objects can serve as references for locations, situations can be temporal references, e.g., the temporal source in “John has been sleeping since his wife woke up” or the temporal goal in “John will stay awake until his wife comes home.”

In the temporal semantic domain, we argue, situations replace objects as beings playing figural roles. When cognitive agents are attuned to situations, they segregate them as figural parts of reality, i.e., as parts of reality that are brought into focus. Sometimes, what is focused on becomes a transition from one situation to another, when, for instance, the former ‘triggers’ the latter. This triggering relation is sometimes a physical cause-effect relation and sometimes a logical relation of entailment or presupposition. In such transitions, the first situation serves as the figural source leading to a figural goal, which is the second situation. Transitions of that sort are occasionally mediated by some other situations. This latter type of situations we will treat as figural paths from source-situations to goal-situations.

This localist treatment of situations also opens an alternative way to interpret a classification of situations dating back to Aristoteles. What made such classifications popular in modern literature was Vendler’s (1957) four-way classification of verbs: *states*, *activities*, *achievements*, and *accomplishments*. States involve static durations in time (e.g., ‘love’, ‘hate’). Activities and accomplishments are dynamic and extended in time (e.g., ‘run’, ‘walk’). Achievements are instantaneous changes from one situation to another (i.e., ‘die’, ‘find’). Telicity is a dimension that cuts across Vendler’s classification. States and activities are atelic, which means that they are not directed to any goal, whereas accomplishments and achievements are telic, which means that they are temporally bounded. Let us give a localist rewording to these distinctions. A state can be isolated as a purely figural situation without entailing any figural source- or goal-situations (e.g., ‘He was asleep’). An activity can be either a purely figural situation (e.g., ‘He was walking everyday’) or a figural path (e.g., ‘He went there running’). An accomplishment can be a figural situation the ending point of which is a figural goal (e.g., ‘He painted a picture’). An achievement can be a figural situation (e.g., ‘He found the pencil’), a figural source (e.g., ‘He started walking’), or a figural goal (e.g., ‘He stopped walking’).

III. Hero’s Journey as a Lattice Structure

In the case of hero’s journey, the lattice-based model is relatively easy to apply to the spatial dimension. When we take Luke Skywalker’s journey in Episodes IV-VI of Star Wars as an example, we can see that the locations on Luke’s way starting with the planet Tatooine, going over the planets Alderaan, Yavin, D’vouran, Minba, Hoth, Dagobah, Bespin and ending at Endor, portray the spatial scene very well. With that approach, Table II could be extended by a third column to specify the locations.

As we mentioned before, a spatial location serves as the ground against which a figure is perceived. Likewise, a temporal location will serve as the ground against which the journey will be conceived as the situation in focus. In fact, everything structured in the spatial domain will be given a parallel treatment in the temporal domain. From this point of view, the lattice structures depicted in the previous section should be considered as templates that can be applied to either the spatial domain or the temporal domain.

In the case of Luke's journey, we see that the source is Luke's refusal of the call to adventure (see Table II). The logic of the scenarios takes us from this source state to a goal state, which the Luke's admittance of what he refused at the outset. The logic simply rests on the fact that an admittance state presupposes an earlier refusal of what is admitted. Throughout the journey, the Hero keeps suffering both physically and psychologically and doubting about his capacity to accomplish the task. It is not wrong to say that the hero's suffering process is the path from the source to the goal, i.e., from the refusal to the admittance. The overall structure of Luke's journey is, therefore, as shown in Fig. 4.

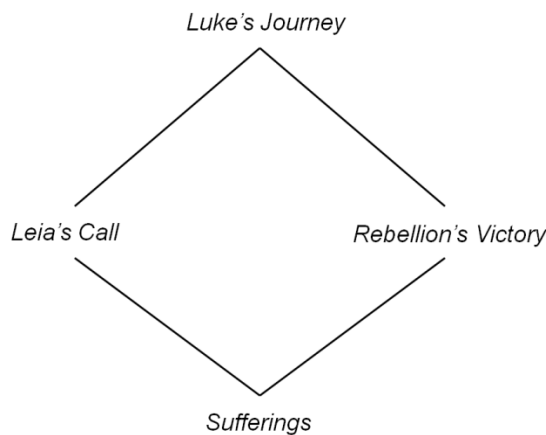


Fig. 4. Luke's journey as a lattice

It should also be mentioned that the journey has a fractal structure. The journey shows the main characteristic of a fractal structure as it is self-similar at all scales. If we go into the internal structural of each situation indicated in Table I, we can notice that each of them has a structure similar to the one depicted in figure 4: Each step which Luke is forced to take brings him into some trouble and sufferings before he admits his destiny and tries to solve the problems. Of course, in the hero's journey the self-similarity is not an exact self-similarity. It is rather a quasi-self-similarity. Otherwise, the story would be dull and uninteresting. Besides, it can easily be seen that the story is not endless. Therefore, we have to conclude that the lattice modelling the hero's journey is to be characterized as a finite and quasi-self-similar fractal.

As pointed out before, each step starts with a given state and ends with the transfers of Luke into another state. From this point of view, Luke's journey could also be depicted as shown in Fig. 5.

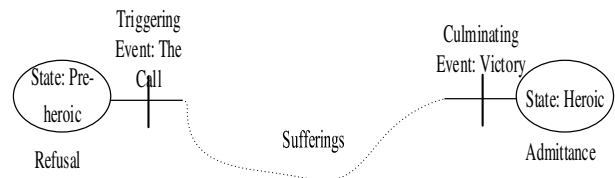


Fig. 5. Luke's journey

Considering both the novels of Star Wars and the films of the episodes IV-VI, it can be seen that the overall story is composed of many small tasks. Although there are many interesting passages and stories within the big picture, we will exemplarily examine the interesting sabre duel between Luke Skywalker and Darth Vader in Episode V after Luke's capture at Bespin. Without going into the detail, Luke is at his training at Dagobah when he receives a call for help from his friends as a vision. Even though he knows very well that he should not break his training, he follows the call and flies to Bespin. Here he faces the trap of Darth Vader and duels with him. The duel ends with both physical and mental sufferings. He loses his hand and learns that Darth Vader is not the murderer of his father but his real father. From the lattice-based perspective, the happenings at Bespin can be formalized as in Fig. 6.

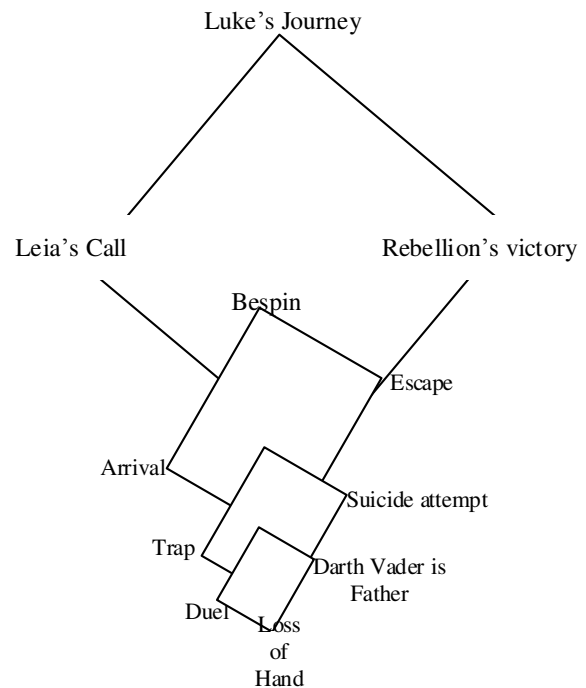


Fig. 6. A sub-adventure at Bespin in Luke's journey

Fig. 6 again refers to the big picture, i.e., the hero's journey, but this time with the hero's sub-adventure at Bespin. It is clear that each state includes the self-doubts and the refusals of the hero. It is also obvious that each state ends with a triggering event which causes new sufferings and ends in a culminating event that transfers the hero into a new state. In the duel at Bespin, the new state of Luke is the admittance of the fact that the man whom he is fighting and who is the master evil is his father.

The main issue is that the above-mentioned finite, quasi-self-similar fractal structure can be discovered throughout the whole journey. The refusal-suffering-admittance pattern will appear again and again till the journey is completed. Hence, the story has the structure which is partially described as in Fig. 7.

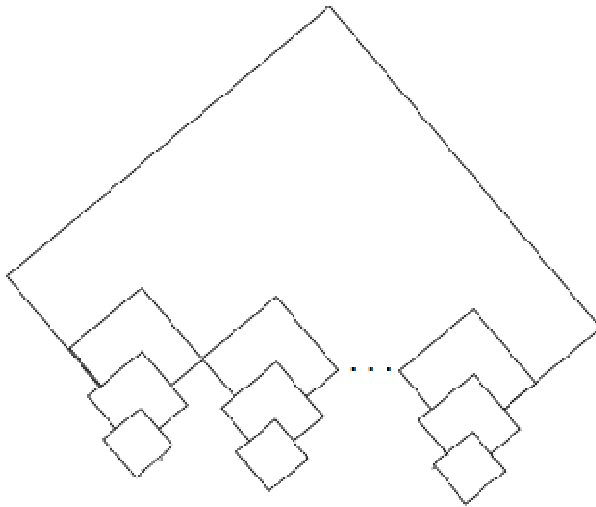


Fig. 7. Luke's journey as a finite, quasi-self-similar fractal lattice

IV. Conclusion and Future Work

One of the great achievements in the history of human beings was the development of language. Language has been and is still one of the main tools to express ideas, to teach, to entertain etc. Using the language, human have been able to create cultures and evolved rapidly. At the beginning, language had a more pictorial form based mostly on icons and glyphs. With time, languages created abstract sets of symbols, namely alphabets (Janson, 2002). Regardless of the tools languages used to express thoughts, ideas etc. it has always been common that people like to tell stories.

It was only a matter of time that somebody asked if there is a common structure in narratives throughout centuries and cultures. It was A. Bastian who asked this question and the answer was "yes" which was given by the works of Freud, Jung, Campbell and others. Human share some structures especially in case of myths and stories which are named archetypes. One of the most interesting archetypes is the hero as a static structure and his journey as a dynamic structure.

In this paper, we asked the question if the above-mentioned journey could be somehow formalized since it is been used extensively in all cultures and in all cultural products like novels, stories, films, and computer games, etc. The foundation to express the journey in a formal way is given with lattice structures. The whole journey can be conveyed clearly as a lattice. As an example, we examined a very good implementation of hero's journey, namely Star Wars Episode IV-VI. Although the weight of this examination lies on the films, the novels have been examined too. We showed that Luke's Journey in Star Wars is a finite, quasi-self-similar fractal lattice. Although it is beyond the scope of this work, it should be mentioned that this structure is not unique to Star Wars

but valid also for all heroic epic films like Matrix, Doctor Zhivago, War and Peace, Lord of the Rings, etc. Even comedy films like Monty Python and the Holy Grail use this structure. Of course, films are not the only cultural products using this structure. As shown by Campbell, myths are the most oldest and successful versions of this structure. Much newer products using that structure include computer games.

One of the main drawbacks of films and computer games is that the scenarios have to be written by professionals, which is very time-consuming. The story engines of computer games have to be implemented according to the story. If the story is not well narrated and the programming team is not aware, the game becomes a weird program where many context problems arise. If the story could be expressed in a formal way, it would be very easy to implement and catch the essence of it.

The proposed finite, quasi-self-similar fractal structure is very easy to understand and implement hence to its strong mathematical background. Given a story to the storytelling engine, a natural language processing unit can derive the steps of the journey and transfer it to the fractal-creating unit of the engine. In this paper, we focused on the temporal aspect of the journey. As we mentioned before the spatial aspect can also be handled easily the same way. This approach can be implemented into the storytelling engine.

In this paper, we introduced the framework for a new kind of storytelling engine. It is obvious, that the realization of this approach requires natural language processing at first. Work is ongoing in implementing a natural language processing unit. Meanwhile, the authors are also working on the implementation of the whole storytelling engine. Frameworks for extracting the spatial structure are also a part of this work. The goal is to create a whole storytelling engine, that derives the spatial and temporal aspects of a story and send them in a well-defined data structure to the animation and graphics part of the game engine, which then creates the complete game world and the game dynamics.

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