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ARTIFICIAL INTELLIGENCE AND LANDSCAPE DESIGN: AI AS AN AIDED DESIGN TOOL FOR GARDENS IN HERITAGE AREAS OF GREATER CAIRO CASE STUDY: SOUND AND LIGHT GARDEN OF GIZA PYRAMIDS

Heba M. Gomaa[1], Eman A. Saleh*[2]

[1]*Department of architecture & urban design, Pyramids Higher Institute (PHI), Cairo, Egypt.*

[2] *Department of Architecture, MSA University, Cairo, 12451, Egypt,*

***Correspondence**: easaleh@msa.edu.eg*

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ABSTRACT

The Government of Egypt is encouraging a number of development projects in historical areas. Developing the Pyramids plateau and its landscape is one of the biggest current projects in Egypt, and other similar projects are added to the future plans. Ancient Egyptian civilization is full of amazing authentic ideas that could be revived to make urban development attached to that civilization. AI in the landscape discipline is forthcoming cybernetic environment, in which designers are conceptualized not as authors but as catalyst agents. The research aims to reach a method for using artificial intelligent in imagining landscape specially in urban development projects in historical areas. The research dependents on inductive reasoning by understanding and analysis elements of ancient Egyptian gardens, the results lead to prompt that could use in AI applications to generate different alternatives specially in ancient Egyptian landscape and thus can be used to develop the historic area.

KEYWORDS: landscape design, ancient Egyptian gardens, Giza plateau, artificial intelligent in, landscape conceptual design, landscape heritage.

الذكاء الاصطناعي وتصميم المناظر الطبيعية: الذكاء الاصطناعي كأداة تصميم مساعدة للحدائق في المناطق التراثية بالقاهرة الكبرى دراسة حالة حديقة الصوت والضوء بمنطقة أهرامات الجيزة

هبه محمد جمعه[1]، ايمان أحمد صالح[2]،*

[1] قسم الهندسه المعماريه، معهد الأهرامات العالي للهندسه و التكنولوجيا، الجيزه، مصر.
[2] قسم الهندسه المعماريه، جامعة أكتوبر للعلوم الحديثه والأداب، الجيزه، مصر.

*البريد الاليكتروني للباحث الرئيسي : easaleh@msa.edu.eg

الملخص

تشجع الحكومة المصرية عددا من مشاريع التنمية في المناطق التاريخية. يعد تطوير هضبة الأهرامات والمناظر الطبيعية الخاصة بها من أكبر المشروعات الحالية في مصر، وتضاف مشاريع أخرى مماثلة إلى الخطط المستقبلية. الحضارة المصرية القديمة مليئة بالأفكار الأصيلة المذهلة التي يمكن إحياؤها لجعل التطور العمراني مرتبطا بتلك الحضارة. الذكاء الاصطناعي في مجال المناظر الطبيعية هو البيئة السيبرانية القادمة ، حيث يتم تصور المصممين الذكاء الاصطناعي في مجال المناظر الطبيعية هو البيئة السيبرانية القادمة ، حيث يتم تصور المصممين ليس كمؤلفين ولكن كمستعمل فقط وهذا ليس صحيح. يهدف البحث إلى الوصول إلى طريقة لاستخدام الذكاء الاصطناعي في تخيل المناظر الطبيعية خاصة في مشاريع التنمية الحضرية في المناطق التاريخية. يعتمد البحث على الاستدلال الاستقرائي من خلال فهم وتحليل عناصر الحدائق المصرية القديمة ، حيث ستؤدي تؤدي النتائج إلى موجهات يمكن استخدامها في تطبيقات الذكاء الاصطناعي لتوليد بدائل مختلفة خاصة بالمناظر الطبيعية المصرية القديمة وبالتالي يمكن استخدامها لتطوير المنطقة التاريخية.

الكلمات المفتاحية: تصميم المناظر الطبيعية ، الحدائق المصرية القديمة ، هضبة الجيزة ، الذكاء الاصطناعي ، التصميم المفاهيمي للمناظر الطبيعية ، تراث المناظر الطبيعية.

1. Introduction

The world now is being computerized whether in performing repetitive tasks or in performing creative tasks that were once limited to a small group of people. Architecture and landscape design were not far from this technology, thus, coupling landscape design and artificial intelligence systems helps in reaching more mature landscape products and retrieving principles that were lost by the speed of life. This integration is achieved by understanding the way both the human brain and AI work in the domain of landscape development.

Nowadays, as everything in life depend on the automation of tasks, studying how to take advantage of this technology let landscape design contribute to the evolution of human everyday life. Therefore, the study tackles the understanding of the historical gardens of Ancient Egypt like; features, hardscape, softscape, and geometry and convert them into certain prompts in the AI system. Furthermore, the results of this prompt are studied to result in a system of inserting prompts to output a reasonable schematic concept of the required garden

2. Research objectives

The research aims to:

Reviving a heritage area in a way that suits the legacy of the past and the developments of the area, whether in local plans or technological developments, by choosing a valuable heritage area and visualizing the possibility of reviving using modern applications of artificial intelligence.

Testing artificial intelligence applications as a designer helper tool in designing the landscape of the opening spaces

3. Research questions

Can machine learning and non-human technologies present a schematic conceptual design for on-ground development?

Can AI applications be a tool for landscape development for a certain site?

What are prompts and keywords for the machine understanding to perform garden in the development of a certain area?

4. The Research Methodology

The research follows three different methodologies to reach the research objectives;

- Using the inductive approach to determine the themes that perform key features for the prompts for the AI
- The descriptive method for the theoretical parts: the characteristics of gardens in the chosen era, the characteristics of the case study garden, and AI concepts.
- The thematic analysis method for analyzing data from the theoretical part.
- The empirical method to answer the research questions and prove if "Machine learning and non-human technologies present a schematic conceptual design for on-ground development". The empirical part used a number of tests using the literature part to conclude an understanding of integration of AI in the conceptual step of Landscape design

5. Machines and Architecture

The expression of Artificial Intelligence was developed in the workshop held on the campus of Dartmouth College in 1965 [1]. This marks the beginning of the age of AI. This paper discusses Cognitive Computing a non-human technology to understand what machines need to mimic human tasks in landscape development. Then in sections, the paper formulates what humans need when they are dealing with an automated system in creative tasks.

5.1. Cognitive Computing

Cognitive computing is first defined by Valiant as "a discipline that links together neurobiology, cognitive psychology, and artificial intelligence" [2] The goal of cognitive computing is to simulate human processes in a computerized model. The computer can mimic how the human brain works by using data mining, pattern recognition, and natural language processing. Cognitive computing is not a single technology, it uses artificial intelligence and machine learning techniques to predict, understand, and make sense of information. This system relies on the human-machine interaction that represents the basis [3]. Building a cognitive service is divided into three steps: ground truth data, build models, and finally train these models. The output of this service reaches the same "true" as the ground truth data [4].

5.2. People's interaction with Artificial Intelligence

The research of Changhoon Oh was introduced to study the impact of how people reason about AI [5]. The results show that in creative or subjective fields, the need for an explanation about reasons why the AI system gives that score is a necessity so, there will be useful communication and interpretation between the two sides on the given scores. Also, experts in the field of study, photography, were the closest scores to AI, which gives some confidence that AI can help mimic the judgments of humans in a certain defined way [5].

5.3. Architecture and Artificial Intelligence Interaction

Architecture shouldn`t be recognized as an artwork or a function-based work only, architecture serves humans and should be created in a way that helps users live a better life and get pleasure when they interact with the built environment [6]. Using computational methods helps ease the process of designing not mechanization of the process and the product.

5.4. What people need from automated systems

People prefer to interact with a system that can automatically run but they lead it, they prefer to take the final decision, and they get frustrated when a system takes it instead of them or make an overall evaluation without interpretation of how it concludes the result. A reliable AI system should have two main features:

a. Let users lead the system, by choosing the way the system will help.
b. An interpretation of each decision made by it should be monitored.

These features will build a complex system, with a lot of data sets fed into it. So, the division of steps should be applied and then a calibrated technique to define the weight of each step to produce an overall rating system will simplify the system and reduce the time of running the system. That's why Discord was chosen and the MidJourney bot was chosen for the Empirical test for various prompts.

5.5. Mid Journey Bot

The user can interact with the *Midjourney* Bot on Discord by typing a Command. Commands are used to create images, change default settings, monitor user info, and perform other helpful tasks. Midjourney Commands can be used in any Bot Channel, on private Discord servers where the Midjourney Bot has been permitted to operate, or in a direct message with the Midjourney Bot.

In order to begin the prompts, the user should choose:

Imagine

Generate an image using a prompt. The user can use words that related to details, time, angle of camera, the way of presentation, the light and the environment.
From the previous part it is clear that Mid Journey gives freedom in writing sentences. Rather, it is preferable to have a detailed description with the use of sentences specific to the place, time, angle of view. this is the same requirements of what the designer needs to revive or create a new perception of ideas. Therefore, the next part of the theoretical study trying to understand the design of ancient Egyptian gardens, and understanding the design of garden of sound and light which is beside Giza plateau development project.

6. Ancient Egyptian Gardens

Ancient Egypt's gardens had a significant role in both their environment and religion. Although the gardens cannot be excavated as structures and tombs can, archeological artifacts that have contributed to our understanding of their design, purpose, and meaning [7].

6.1. Gardens Planning and softscape

The temple gardens were an integral element of the complexes. They were seen as a part of the cosmos, which the temples symbolized.
Based on the information gathered from this far on the sites, it is clear that there was not a great change in the gardens from the Pre-dynastic to the Ptolemaic period. There are also representations of gardens and plants in paintings and texts, in addition to these excavation reports. These representations were regularly found on the walls of tombs and temples.

Figures 1, 2, 3 show paintings from tombs and temples illustrate the structure and elements of gardens and their description; Fig. 4 show an imagining preceptive of the garden.

The various forms of Egyptian gardens shared some features, the design of the gardens constantly included water, which was symbolic of the primordial waters of creation. Sometimes there was an island located in the center of the body of water to symbolize the initial moments of creation. The body of water followed the east-west orientation of the temple and was rectangular or t-shaped, in the center of the garden. These pools were used as a water source for garden irrigation, as a habitat for fish and ducks, boating, and perhaps even swimming. The axis of the garden usually ran through the center of the pool, and in many cases was an axis of symmetry [7,8].

The pool was with layered terraces surrounding it , On the lowest terrace closest to the pool were low plants, often extending into the pool or floating upon it Papyrus and lotus flowers were grown in many of the ponds and lakes at the temples there were small

flower beds around the pool on the next terrace were medium-height bushes, tall flowers, and small trees were used like Narcissus tazetta, chrysanthemums, Nerium Oleander, Jasmine, and pergola with grabs used in ancient Egyptian garden specially in middle place, then tall trees, date palms and Hyphaene Palm**.** Table 1 [8 -10].

Fig.1 . A scene shows Nakht and his wife approaching Osiris and Ma'at in their garden late Eighteenth or early Nineteenth Dynasty (about 1336-1294 B.C.) [11].

The scene shows the central pool and the sycamore tree stands in front of his tomb and signified rebirth and fertility [11].

Fig. 2. The Garden, painting from Nebamun (Nebamun is a scribe in charge of grain collection for the city in the 18th dynasty of Ancient Egypt)tomb, c.1350 B.C.E., 18th Dynasty [8].

Nebamun's garden in the afterlife is like the earthly gardens of the wealthy in ancient Egypt. The pool is full of birds and fish, surrounded by borders of flowers and rows of trees. The fruit trees include sycamore-figs, date-palms, and Hyphaene (dom-palms); the dates are shown in different stages of ripeness. On the right of the painting, the goddess Nut, leans out of a tree, and offers sycamore-figs to Nebamun (now lost). On the left of the pool, a sycamore-fig tree speaks and greets Nebamun as the owner of the garden [11].

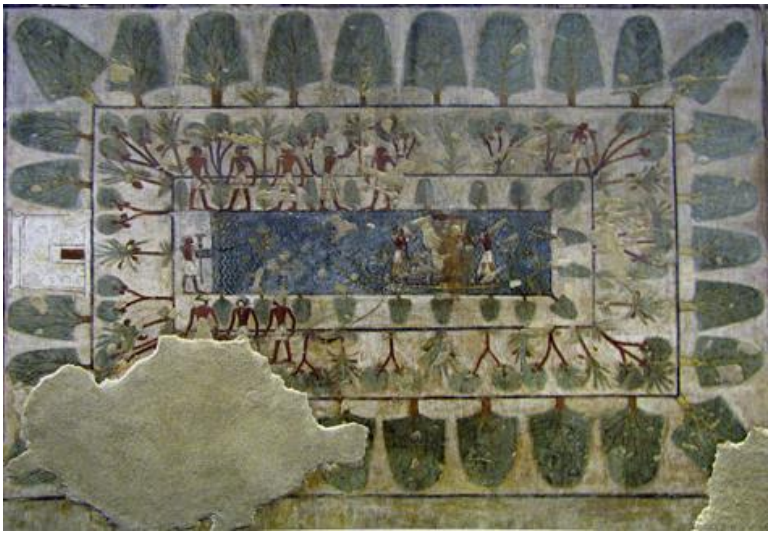


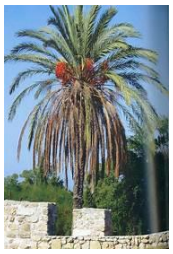
Fig. 3. A wall painting in the Tomb of Rekhmire, [12] (metmuseum.org).

the paint shows the trees that were grown in Egyptian gardens to supply fruit and provide shade These would include Sycamores, Punica granatum, and olive, The tree in the middle is the date and Hyphaene palm. Trees were planted in straight lines and in some gardens in rows according to their species. Trees were also used as windbreaks around gardens. The garden wall served several purposes, to keep unwanted people, and wild animals out of the garden [8].

Fig. 4. an imagined perceptive of the Egyptian house garden [13].

In the houses of the ancient Egyptians, the garden Dominates the scene as the building was usually hidden inside the garden and shaded by trees and overlooking ponds and swimming pools. There are aquatic plants in the pool, flowering shrubs are around the pool then trees and palms.

Table 1. Plants in ancient Egyptian garden.

			
Papyrus	lotus flowers	Narcissus tazetta	Chrysanthemum
			
Nerium Oleander	Jasminum	Grapevine	Sycamores
			
Punica granatum	Olive tree	date palms	Hyphaene

6.2. Gardens Hardscape

Although painting gives us imagination about the planning and plants of the garden it does give more details about the material, furniture, or colors used in the garden, the archeological artifacts, the site, and the period of building pyramids could give specific knowledge about material, colors, and furniture.

The valley temple of King Khafre which directly infant of the garden explains the material chosen to make floors, walls, and columns in this site, the valley temple consists of limestone blocks covered with granite, while the floors are covered with alabaster, and its vast courtyard includes homogeneous granite columns, and its wide courtyard

includes granite columns and the niches carved in the walls included statues of the king. [14] as shown in Fig. 5.

Very little furniture has survived to describe the furniture of the same period of building pyramids as in the second half of the Old Kingdom, chairs with arms and backs began appearing. Large-size tables were rare. Egyptian furniture designs of this age often incorporated metalwork. Also, the inlay was increasingly used, as well as relief carving, and gilding, for lighting the Ancient Egyptians made A lamp consisting of a container for the oil with a wicked dipping into the oil, their wicks by twisting together the fibers from flax plants [15]. as shown in Fig. 6.

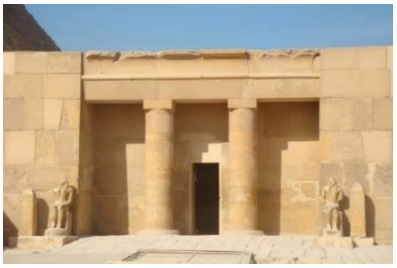


Fig. 5. The valley temple of King Khafre

(a)

(b)

Fig. 6. (a) Furniture of old kingdom, britishmuseum.org

From the previous part, it is clear that ancient Egyptian gardens preferred to design with specific order that could be suitable to open the view for smaller plants with Blooming flowers at the middle of the garden and fruit plants, like, Punica Granatum and Date palms surrounding the flowers. Furthermore, planting trees in rows is suitable to the system of irrigation.

7. Research location area

As the Egyptian government is planning to revitalize the historical areas in Ancient Egypt, thus, the chosen area for the empirical study was according to the areas in the vision which is the sound and light garden in front of the Pyramids. as shown in Fig. 7.

7.1. Case study overview

Development of the Pyramids Plateau project forms a component of an overall strategy to maintain the heritage of the plateau. Another objective is to enhance the quality of the experience of the site visitors, by enabling entry to the site's architectural complex, respecting the heritage, and feeling a cautious harmony [16].

The Giza Pyramids World Heritage Site Rehabilitation Plan started in January 2009, and it includes a Heritage Plan to conserve heritage by pedestrianizing the Pyramid Precinct and rerouting all vehicular traffic, removing structures that significantly change the nature of the heritage site, and moving all horseback riding and recreational activities from the Pyramid Precinct to the Environs. [16] The plan is still modified according to working conditions as a bridge is added to connect the grate Egyptian Museum to the pyramids plateau. The site has four main gates for visitors, the plan is Sphinx Gate is one of them, it is the gate that leads to the light and sound garden as shown in Fig. 7.

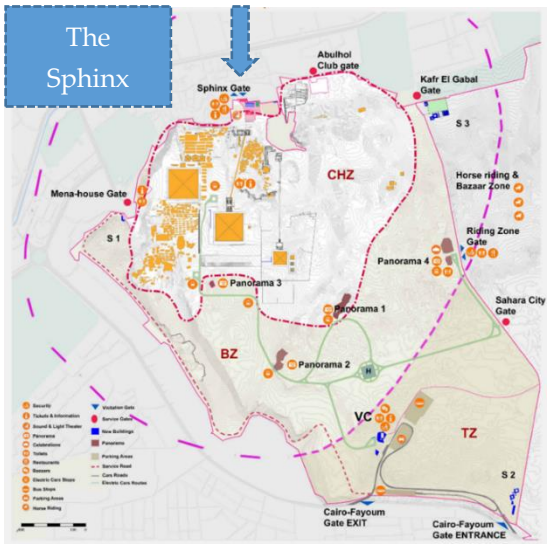


Fig. 7. Development of the Pyramids Plateau project, and showing the entrance [16].

The garden of sound and light has a strategic place as it is in front of pyramids, sphinx statue, as shown in fig. 10. It is about 4000 m^2. It's entrance to the light and sound show telling the history of ancient Egyptian civilization. Fig. 8 and 9 shows that at 2575-2475 BC this place was the lack and know the garden now is at this site.

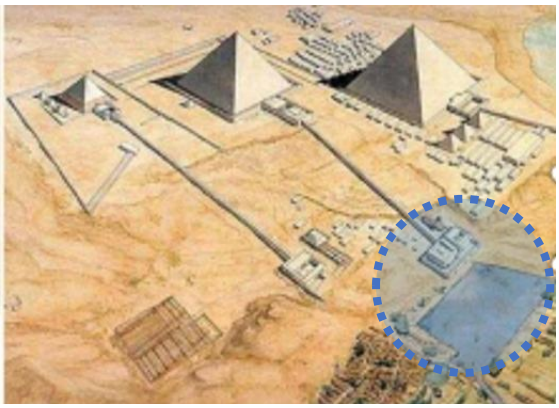


Fig. 7. Giza pyramids complex, fourth Dynasty 2575-2475 BC

Fig. 9. Gyza pyramids complex in the year 2023. Source: Google Earth, 2023, edited by Authors

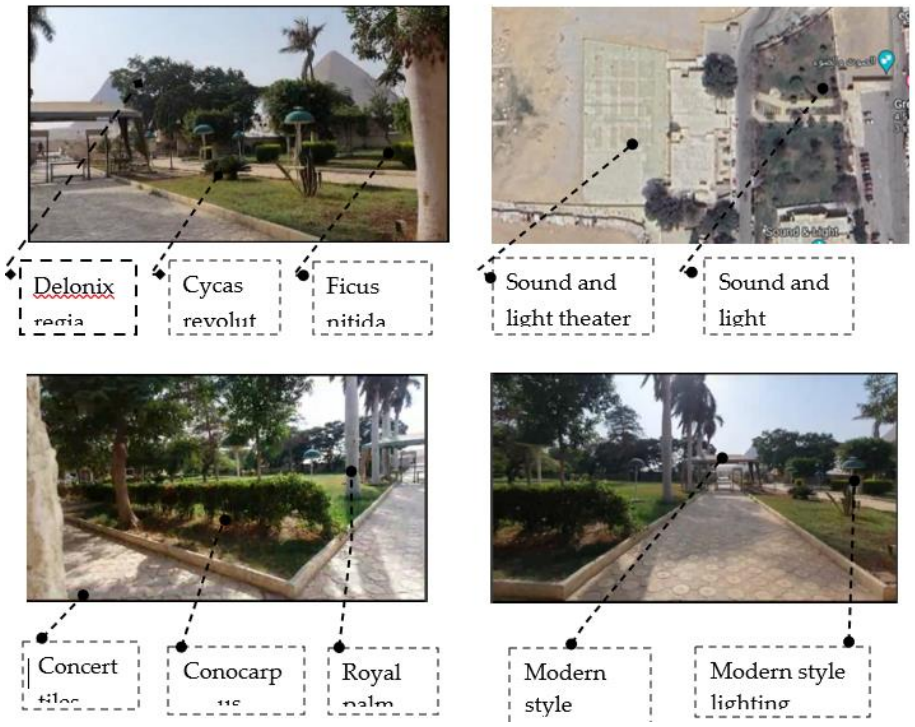


Fig.8. Current situation of Garden of Sound and Light Garden, Authors, 2023

the garden could be illustrating part of this story and to be related to the Giza Plateau project idea. the current situation of the garden is analyses as shown in table 2 to know whether it is related to ancient Egyptian gardens ideas and element or not.

Table 2. Analysis of the current situation of Garden of Sound and Light Garden,(Authors, 2023)

The main feature of the existing garden	Description	Notes	Related	Not related
Planning	central axial walkway		✓	
	The plan is almost in the shape of a rectangular shape		✓	
	palms are in the middle of the garden	palms were in the back of the pharaonic garden		✓
		The water feature is not part of garden planning		✓
	The end of the view is trees and pyramids	Trees at the end weekend the pyramids and templet seen		✓

Soft scape	Palms and palm-like - Royal palms - Cycas revoluta	Royal Palms is native to Cuba and Panama [17, p. 52] Cycas revoluta is native to [17, p. 63]		✓
	Delonix regia tree	It is native to Madagascar and India [17, p. 105]		✓
	Ficus Nitida	It is native to Malaysia, Borneo [17, p. 123]		✓
	Conocarpus lancifolius shrubs	It is native to coastal and riverine areas of Somalia, and Yemen		✓
hardscape	wall around	Low walls to protect the garden and at the same time to not close the scene of pyramids	✓	
	Modern metal Lighting feature			✓
	Modern pergolas with metal and fabric			✓
	Modern plastic seats			✓
	Concrete interlock tiles			✓
	Earthy and natural colors		✓	

From the previous analysis it is clear that the garden has an important place in the project and the design and elements of the garden can be developed to present ancient Egyptian landscape ideas and images.

8. Empirical study

The empirical study depended on using prompts that describes ancient Egyptian garden then adding different features and observe the results, these steps taken to reach the way that gives better initial design by using artificial intelligence.

8.1. Composing prompts

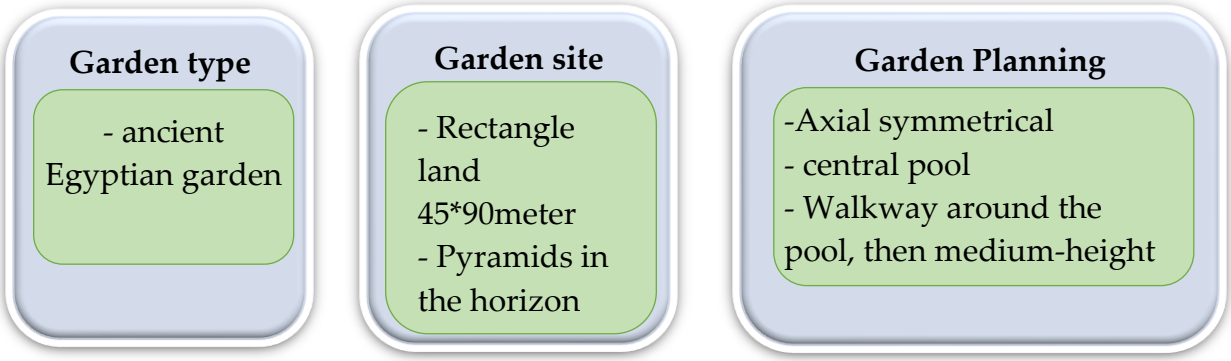
Test 1: Details Prompts: The first attempt focused on showing limited elements and details, not the structural composition of the garden, in order to learn about the ability to give close visualizations of what was there and to understand how artificial intelligence can help in showing the design elements at different levels

Test 2: Complex Prompts: It is suggested that the method is used for the description should consist of several parts, which are as follows:

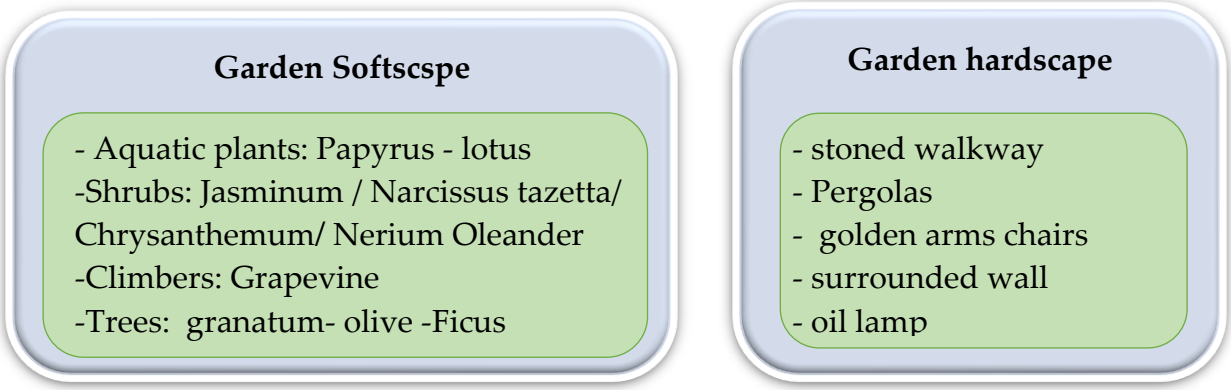
Step 1- Putting sentences or words that describe main character of the garden: style, location and garden planning

Step 2- Adding words describing details of softscape and hardscape
Step 3 – Add words to control how the image looks. Fig. 9 shows the suggested method of composing prompt to get a schematic conceptual design from AI in landscape.

step 1: the main character of the garden



step 2: adding details of softscape and hardscape



step 3: change the type of view

Fig. 10. Method of composing prompt to get a schematic conceptual design from AI in landscape. (Authors, 2023)

8.2. Empirical results and observations

Test1: creating images of limited elements and details, table3 shows prompt, results and observations.

Table 3 create *softscape and hardscape elements. Using Bing image creator (Authors,2023)*

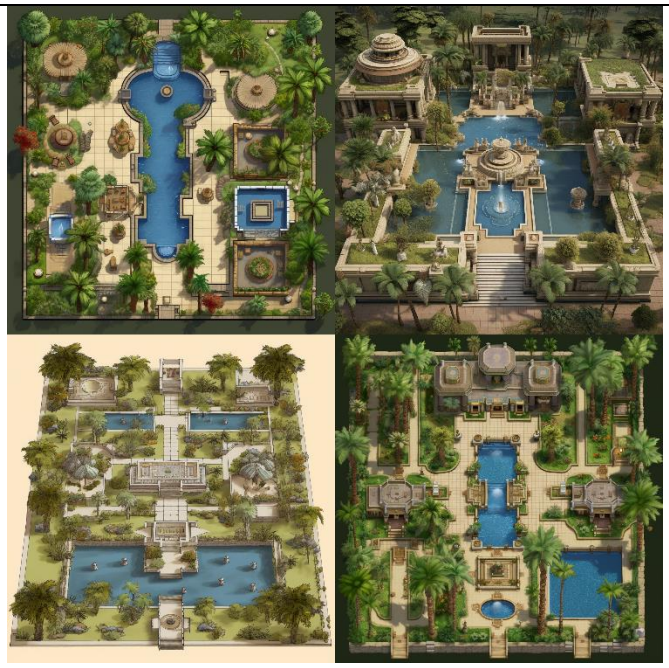
<table>
<tr><td colspan="3">1- Creating images of softscape elements</td></tr>
<tr><td>Prompt: Hyphaene Palms</td><td>Prompt: granatum, olive, Ficus sycomorus Trees</td><td>Prompt: Chrysanthemum, and Nerium Oleander</td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Prompt: Jasminum, and Narcissus tazetta</td><td>Prompt: Grapevine</td><td>Prompt: Papyrus and lotus plants</td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td colspan="3">Observation:
• In trees: The Ficus sycomorus tree is not present in its correct shape
• In palm: The Hyphaene palm has an incorrect image, so the program gives an image of the date palm instead.
• In the bushes: some additions were placed, such as orange fruits not mentioned
Conclusion: Therefore, its scientific base in details is insufficient to rely on, and the architect must be aware of the information required to be able to benefit from or exclude from the results</td></tr>
</table>

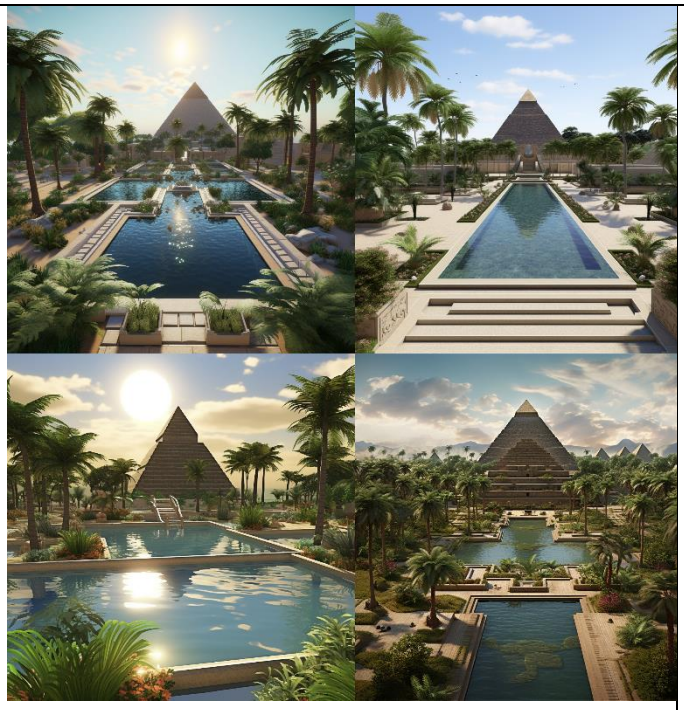
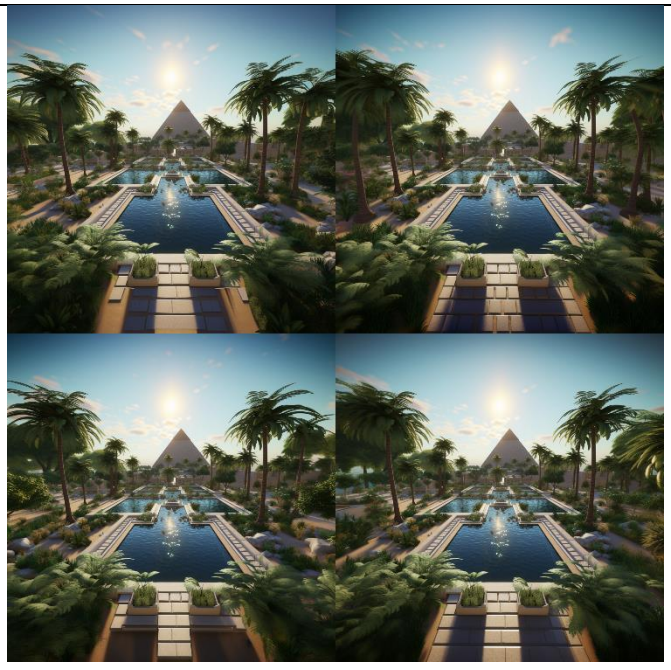
Test 2: composing prompt to get a schematic conceptual design, table 4 shows steps, prompts, results and observations.

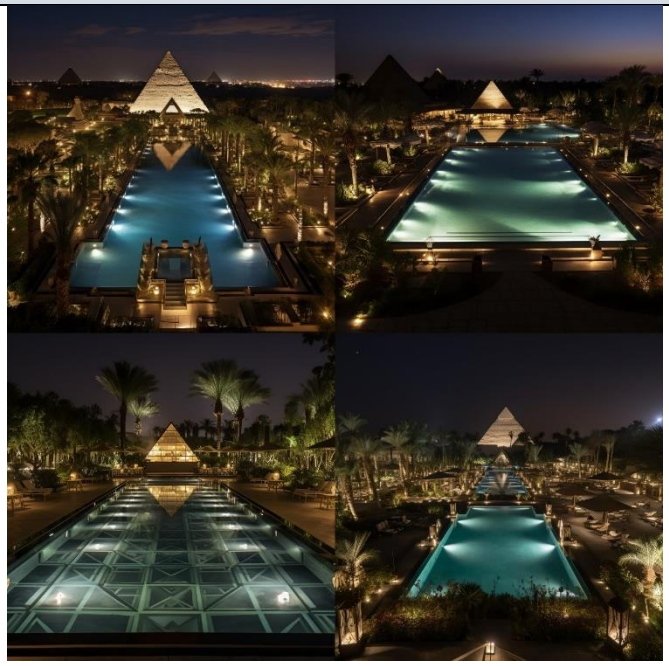
Table 4. using complex prompts with various steps. (Authors,2023)

No	Prompt	Result	Observations
Step 1- Adding sentences that describe main character of the garden			
1	An ancient Egyptian axial symmetric garden, central big rectangular pool, then walkway, then medium-height bushes, behind bushes are taller trees pyramids at the horizon of the garden and at the end of shot, 4k resolution		It was more complex prompt it describes mainly the organization of the planning and the program understand it. It is observed that the program understood the pyramids to be a building in the form of a pyramid, thus, the next prompt the Egyptian pyramids should be clearly illustrated The program suggests pattern in the pool that are not needed as it wasn't in that era, but this clarifies that program has the ability to add unexpected things

3	An ancient Egyptian axial symmetric garden, central big rectangular pool, **flowers on the edge of the pool**, then walkway, then medium-height bushes, behind bushes are taller trees the garden is **surrounded with low walls, three Egyptian** pyramids at the horizon of the garden and at the end of shot, 4k resolution.		In this prompt, more description for the garden were added, thus the bushes and trees had more emphasis in all images but in different ways.
Step 2- Adding words describing details of softscape and hardscape			

4	pharaonic axial symmetric garden, , central big rectangular pool, flowers on the edge of the pool, then walkway, then medium-height bushes, behind bushes are taller trees, palm trees around the pool, an **island inside the pool with papyrus plants and lotus plants**, the garden is surrounded with **low walls**, Egyptian pyramids at the horizon, **golden columns with lotus tops** surrounding the pool, 4k resolution.		If more details for landscape were added to the prompt the images would rather be in a form of a plan as shown to show the settings of various elements of landscape distributed in the plan. The program added building without prompt and its style is not pharaonic When the word of pool repeated many times in that prompt the image contains more than one pool

5	Egyptian pyramids at the horizon, pharaonic axial symmetric garden, central big rectangular pool, flowers on the edge of the pool, then walkway, then medium, water lilies in the pool, small planting around the pool and bushes around the pool, behind bushes are taller trees, palm trees around the pool, an island inside the pool with papyrus plants and lotus plants, the garden is surrounded with low walls, golden columns with lotus tops surrounding the pool, 4k resolution.		In this prompt, the Egyptian pyramids are meant to be in the horizon of the image. That's why it was mentioned at the beginning of the prompt and details of the garden began to appear clearly with different ways in each image.
	Egyptian pyramids at the horizon, pharaonic axial symmetric garden, central big rectangular pool, flowers on the edge of the pool, then walkway, then medium, water lilies in the pool, Small planting around the pool and bushes around the pool, behind bushes are taller trees, palm trees around the pool, an island inside the pool with papyrus plants and lotus plants, the garden is surrounded		In this prompt, the nearest imagined garden for the site was chosen and by the application of the same prompt on the image it resulted in nearly the same images with some variations in the landscape.

	with low walls, golden columns with lotus tops surrounding the pool, 4k resolution		
Step 3: changing the type of view			
	a wide shot of pharaonic garden, Rectangle land 45*90 meter, Giza Pyramids in the horizon, axial symmetrical garden, meter wide central pool, lotus on the pool, Papyrus, around the pool, stoned Walkway around the pool, golden arms and oil lamp chairs on the walkway, then plants: Jasminum, Narcissus tazetta, then pergola with Grapevine, then sycomorus tree, date palm, wall surrounded the garde n		The night type of view gives an ideas to lighten the garden at night as it gives a way to how emphasize on pool, plants, pyramids at night. And using the keyword of wide shot didn't make a Noticeable change in the shot.

Conclusion & Discussion

Urban spaces are a major part in the rehabilitation of heritage areas projects, these spaces undoubtedly are related to landscape design, and this is a good opportunity to revive the heritage of landscape related to those civilizations. The research answered the offered questions which are related to using AI in presenting conceptual design as the following:

- AI technology presented, in Mid Journey Bot in Discord as an example of application of AI in Architecture proved to be a tool for conceptual landscape development. However, all the results proved to be schematic concepts, even though the program presented some sort of detailing of softscape and hardscape.

Figure some of the details which appeared in one of the prompts, however other details didn't appear in the chosen prompt.

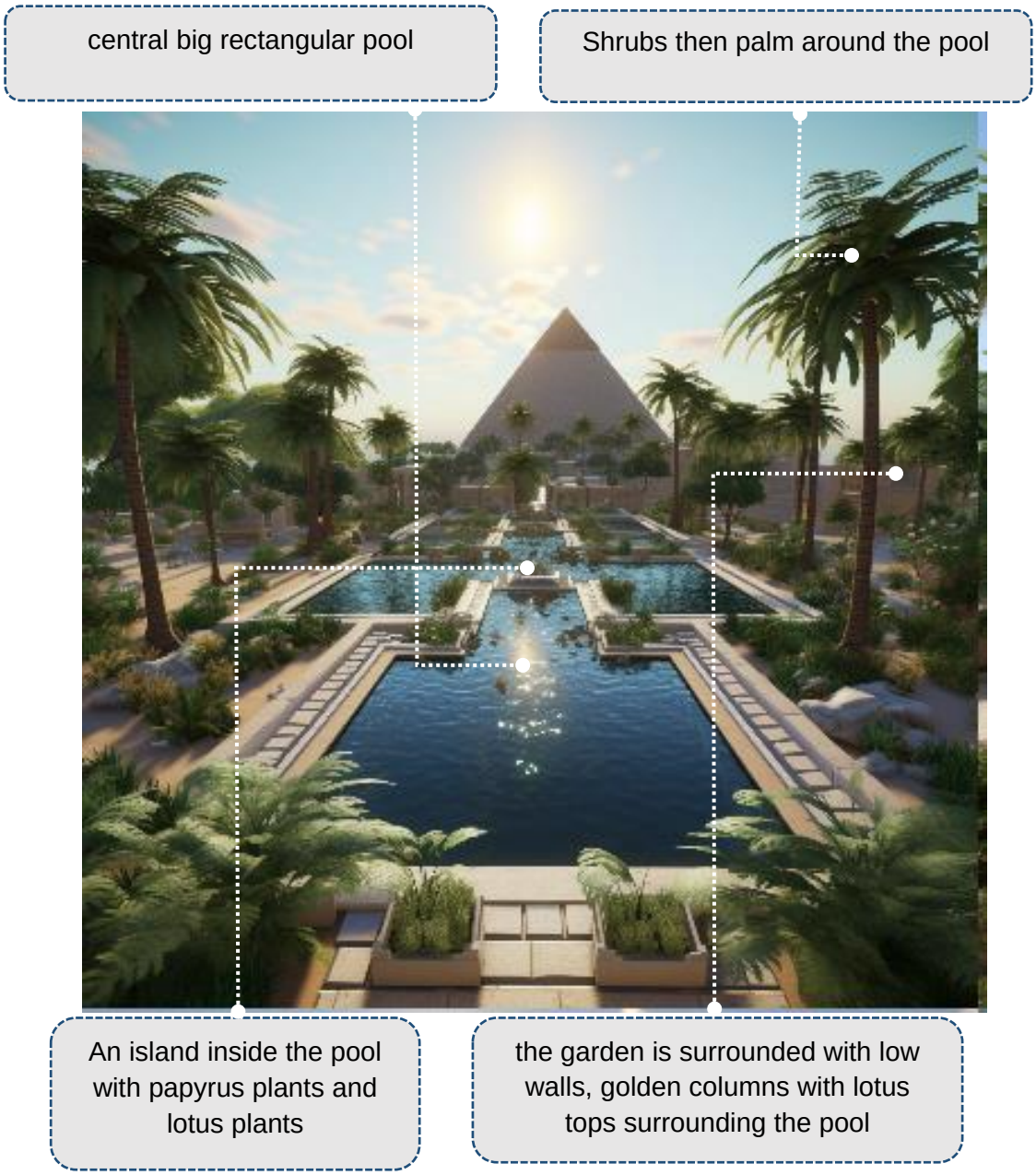


Fig. 11. shows some of the details in the chosen prompt which appeared clearly in the AI generation (Authors, 2023)

- The research presented after many prompts imagined pictures of the whole ancient garden using the hardscape and softscape which was offered in the prompts. The program also understood the hierarchy of the landscape as a whole,

like, the levelling of different trees and bushes, as it is noted that the structure of the garden given by artificial intelligence is very similar to the structure that was imagined to the gardens of ancient Egypt.

- The research suggests a method to composed the prompt, that method contains words about main character of the garden as style, site, and planning, then try to correct inaccurate words, then adding details and type of shot to prompt. That method gives a conceptual design that is very close to the image of ancient Egyptian garden.

Recommendations

- Many people around the world want to learn about Egyptian civilization, but most of the attention is focused on the historical buildings and artifacts, but there is still more knowledge and sensory experiences that can be provided to them in the field of site coordination by presenting models that simulate different civilizations and the ideas that is presented in landscape field.
- Through the testing of an artificial intelligence tool in this research, it was found that AI understands the words expressing the layout and some details, and this indicates that it can be easily used to express ideas, but it could give results that are not related to real historical subject, so the user should have first the enough knowledge that related to the subject to have the upper hand, and that also help in creating the appropriate prompts.
- The field of site landscaping is an integral element in the development of heritage areas, and therefore it is preferable to consider its design so that it is compatible in design with the rehabilitation of those heritage areas.
- It is possible to use artificial intelligence to develop new concepts for ancient heritage elements, but this also requires artistic taste and skill so that there is no distortion of heritage through new products that do not take into account the understanding of heritage and the rules of selection.
- The researchers used the Mid Journey bot in Discord application to illustrate their results, thus the offered prompts had been developed in this bot only. Thus, it is recommended to use Mid Journey Bot for similar projects of Heritage areas' landscape

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