

Leveraging LLM and Web Languages to Construct Vastu Tool for House Map Division and Answering Queries

Anushkka Dhamija and Brijesh Kumar

Information Technology, Indira Gandhi Delhi Technical University for Women, Delhi, India
anushkka160bttit20@igdtuw.ac.in and brijeshkr@igdtuw.ac.in

Abstract: This paper introduces a method for integrating ancient Vastu Shastra principles into modern house division using Large Language Models (LLMs). The Vastu Shastra Tool combines traditional wisdom with modern technology, offering features like house map division based on com-pass degrees. It aims to help homeowners & architects design spaces in accordance with Vastu principles. By incorporating Vastu Shastra into modern techniques, tool assists in making optimal choices for room placements and remedies for inaccuracies. This technology and traditional knowledge fusion is a significant advancement in architectural design, promoting harmony and well-being in living spaces. The paper has been supported with case studies on Angkor Wat and Infrastructure Leasing & Financial Services (IL & FS) which depict the Vastu features of these places and the results obtained from our tool aligned with these features.

Keywords: Chat Interface, ChatGPT API, House Map Zoning, Vastu Shastra.

1 Introduction

There is a need to harmonize home structures with individual preferences and Vastu principles. Unlike previous studies focused on theory, our research introduces a personalized tool catering to diverse user needs, rooted in ancient Vastu Shastra. This tool offers various functionalities, including Vastu remedies and zone placement advice. Utilizing advanced LLMs like GPT-3.5, known for their language comprehension, we integrate HTML, CSS, and JS to create customizable house map grids and chat interface for Vastu related queries and remedies. This innovative tool merges Vastu and Technology through a chat interface, providing human-like interaction and support. Table 1 below shows a comparison of the different proposed approaches.

Table 1. Table showing comparison of proposed approaches.

Parameter	Manual Map Gridding	Vastu Tool
Type	Manual	Software
Complexity & Time req.	High	Low
Human Calculation	Required	Not Required
Accuracy	Moderate	High
Addressing Questions	Manual Google Surfing	Interactive Chat Interface
Integration with LLMs	No	Yes

1.1 Theme of the work

The research aims to develop a Vastu application integrating a chat interface powered by a Large Language Model (LLM) for intuitive interaction and a geometric division of house maps to enhance spatial understanding and zone arrangement alignment.

A recent study highlighted in The Economic Times reveals that 93% of home buyers in major cities prioritize Vastu-compliant homes. With Vastu principles gaining traction in contemporary architecture and technology advancing rapidly, integrating these fields offers promising opportunities. Our tool justifies the house map into 8/16 zones and directions and helps in analyzing the placement of rooms and its impact on us.

2 Literature Survey

Vastu Shastra, an ancient Indian architectural science, focuses on creating balanced living spaces to enhance well-being [1]. Dividing house maps into zones dedicated to deities or elements reflects the spiritual significance of architectural design [2][3]. Traditional Vastu principles, combined with modern technology, influence decisions in home construction [4]. The impact of Vastu effects, such as colors and directions, on living spaces is supported by house maps [5]. The Mahavastu's 16 zones are widely used in Vastu, offering guidance on spatial allocation and remedies. Surveys show a growing trend in society supported by modern case studies [6] towards exploring and believing in mythology and astrology [7]. Cities are adopting Vastu science in urban planning for sustainable development [8]. Leveraging technology, we provide chatbot for personal assistance in Vastu using Large Language Models (LLMs) [9].

3 Methodology

This section gives development process and implementation of our tool. We developed a website utilizing HTML, CSS, and JavaScript technologies, incorporating an AI chat interface powered by the ChatGPT API as shown in Fig. 1.

3.1 Development and Implementation

- Structure Creation: User-friendly GUI with functional buttons & input options.
- Panel Features: The panel can add layout, pin image, and open AI chat interface.
- Playground Setup: A playground area allows users to add layout images, pin points, and view zone divisions via an SVG compass.
- Chat Interface: On AI toggle, users engage with LLM for insights on favorable directions and remedies.

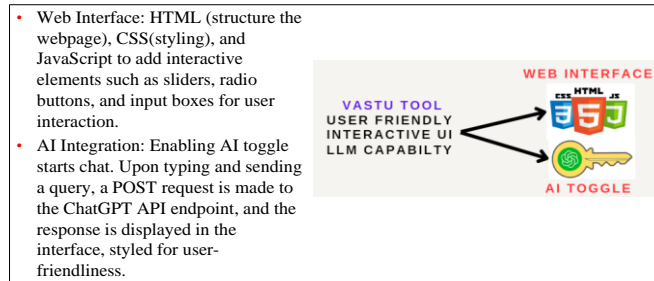


Fig. 1. Web Interface tech stack used along with AI integration requirements.

4 Experimental Setup

This section describes the system architecture, experimental design and algorithm phenomenon that is helpful in experimental setup of Vastu tool.

4.1 System Architecture and Experimental Design

- Layout Image Layer: The foundational layer containing house or office layout.
- Canvas: Utilizing a transparent canvas overlaying the image for pinning points.
- SVG Compass: A customized compass, SVG element, indicating different zones.
- AI Integration: Use an LLM (ChatGPT) to access room on toggle, for queries.
- Query: User's questions trigger API call to the ChatGPT model shown in Fig. 2(a).
- Response Retrieval: The model processes the query and returns a formatted response via API shown in Fig 2(b), which is displayed in the chat interface on screen.

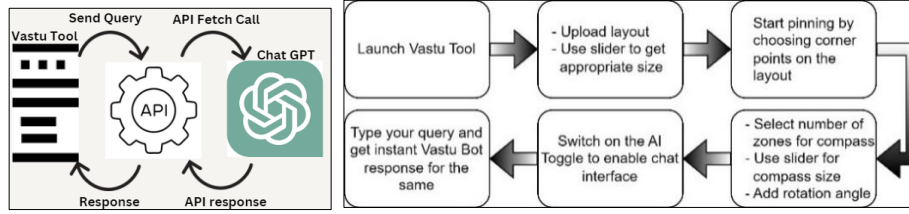


Fig. 2. (a) API call architecture and (b) Step-by-step guide

4.2 Algorithm

Pinning: We are using the HTML canvas element, which allows us to draw graphics on a web page. For pinning, we calculate the x & y coordinates, the point where we click our cursor in reference to the playground where the canvas is placed. JS code snippet to find (x, y) coordinate on the screen is shown below.

```
const rect = canvas.getBoundingClientRect();
const x = e.clientX - rect.left;
const y = e.clientY - rect.top;
```

API Call: We initiate an API call to a ChatGPT endpoint, sending a request with specific query. ChatGPT server receives our request and processes it.

5 Results

This section provides the results of our Vastu Tool chat interface screen. The accuracy is further determined in the case study section with related screenshots. Fig. 4 represents a prototype of our tool tending to user's query page and showing response in the chat interface for the query: 'what is vastu?'

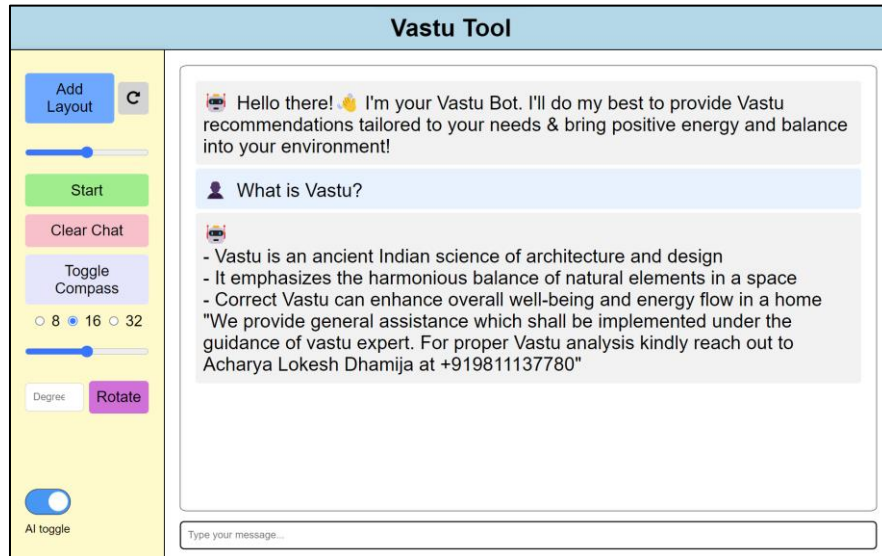


Fig. 4. AI Chat Interface representing a prototype of our tool for user query: What is Vastu?

6 Case Study

6.1 Case Study 1-Angkor Wat

Hindu-Buddhist temple in Cambodia, uses Vastu Shastra principle of grid architecture.

- Vastu features of Angkor Wat and its detailed study in figure 5.

The Vastu Purusha Mandala, represents the universe's blueprint. It aligns architectural designs with celestial movements, harmonizing structures with cosmic energies. The mandala's Chaturbhuj square symbolizes Earth's foundation, with similarities to astrological charts. Depicting 45 deities subduing the Vastu Purusha, it's believed to enhance space's energy and quality of life. Adhering to its principles ensures harmony with cosmic forces and deities.. These features have been presented in Table 2.

Table 2. Features of Angkor Temple according to Vaastu principles.

Aspect	Description
Orientation	west-facing, reflecting harmony with natural elements.
Layout	follows a mandala-like plan, with concentric galleries and structures arranged around a central tower.
Symbolism	cosmic order and harmony, resonating with Vastu Mandala's emphasis on geometric proportions and spatial organization.
Architectural Features	incorporates intricate carvings & sculptures depicting Hindu cosmology & mythology, which align with sacred Vastu principles.
Cultural Influence	It's architectural grandeur & spiritual meaning influence art, architecture, & culture across Southeast Asia, reflecting Vastu principles.

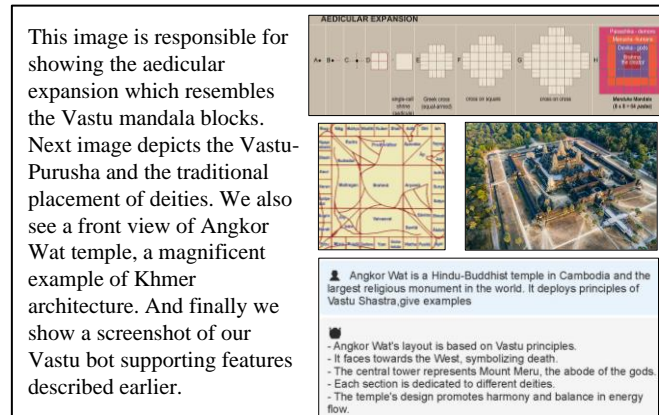


Fig. 5. Angkor Wat Case Study

6.2 Case Study-2- Infrastructure Leasing & Financial Services (IL & FS), Bandra Kurla Complex, Mumbai

IL&FS is an Indian state-funded infrastructure development and finance company. It was created by public sector banks and insurance companies and faced major crises in 2018, making some suspicious vastu defect emerge in office premises, shown in fig 6.

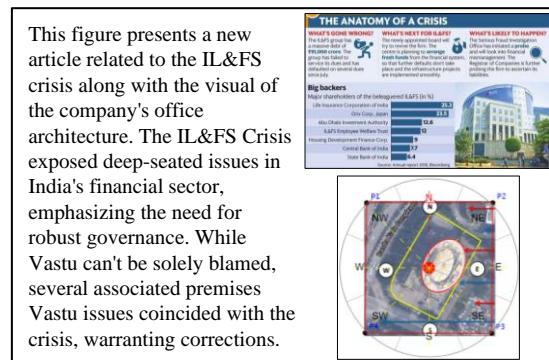


Fig. 6. IL & FS Case Study

- The Output of our tool verifying above vastu features are shown in Fig 7.

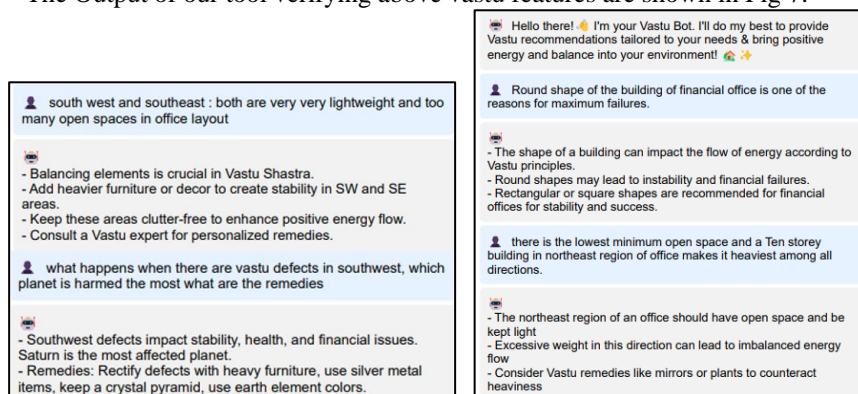


Fig. 7. Output chat interface for Infrastructure Leasing & Financial Services office's vastu q/a

- Table 3 states Vastu features of Infrastructure Leasing & Financial Services

Table 3. Infrastructure Leasing & Financial Services office features according to Vastu.

Feature	Significance/Issue
Round shape of the building - reason for failure.	Rectangle office buildings preferable
North-East- should be lightweight, but, here, there is lowest open space and a 10-storey building in this region makes it heaviest directions. South -West & South-East should be heavy, but, both are lightweight/open spaced.	This affects new business opportunities, the inflow of funds, and lack of clarity towards feasibility. As there are 2 buildings with 10 & 20 floors each in this region. Responsible expenses along with delay and obstacles.
South-west vastu defects (responsible for funds blockage & huge losses)	Need corrections

7 Conclusion

The Vastu Tool exemplifies the transformative influence of artificial intelligence on the realm of Vastu. It spearheads the division of physical house/plot maps into directional zones which help in further study of correct & incorrect placements within a living space, their remedies and impact and other necessary responses to curious user queries on vastu. Enhancements such as integrating augmented reality (AR) technology for visualizing designs, offering professional consultation services with certified experts, providing interactive tutorials and workshops, developing a mobile application, and implementing Vastu energy bar graphs and database save options can further enhance its functionality.

8 References

1. Shanta D., Mahendra J.: Redefining Vastu Shastra Principles with Reference to the Contemporary Architectural Practices in India. *Journal of Pharmaceutical Negative Results*, 11(3) 349–58, (2022).
2. Ruchika S.: Study of Principles and Directions of Vastu in Residential Space. *International Research Journal of Engineering and Technology*, 7(2) 97-102, (2020).
3. Mehul H., Priyanka R.: Vastu Shastra: A Vedic Approach to Architecture. *International Journal of Engineering Research and Technology*, 11(2) 295-298, (2022).
4. Reeta G.: Comparison of Vastu Shastra with Modern Building Science. *International Journal of Research and Scientific Innovation*, 3(7) 118-121, (2016).
5. Utpal K. N., Shravani N., Antara N.: Utility of the Ancient Indian Science of Vaastu in Modern Architecture. *Journal of Civil Engineering and Environmental Sciences*, 3(1) 008–012, (2017).
6. Pashmeena V. G., Abraham G.: Scientific Rationality in Vaastu Purusha Mandala: A Case Study of Desh and Konkan Architecture. *New Design Ideas*, 5(2) 195-209, (2021).
7. Piyush D. P., Piyushkumar J. P.: State of Art on Vastu Shastra. *Journal of Harbin Engineering University*, 44(7) 1264-1271, (2023).
8. Reena P.: Vaastu Shastra: Towards Sustainable Development. *Sustainable Development*, 17(4) 244–56, (2009).
9. Rohit T., Niraj W.: Design and Development of CHATBOT: A Review. In: *INTERNATIONAL CONFERENCE on “Latest Trends in Civil, Mechanical and Electrical Engineering”*, Bhopal (2021).