Emine Demir

HARMONIZING VR SPACES
Application of Feng Shui in VR Level Design

Bachelor's thesis

Bachelor of Culture and Arts

Game Design

2025

South-Eastern Finland
University of Applied Sciences

South-Eastern Finland University of Applied Sciences

Degree title	Bachelor of Culture and Arts
Author(s)	Emine Demir
Thesis title	Harmonizing VR spaces
Commissioned by	Xamk Game Studios
Year	2025
Pages	47 pages, 4 pages of appendices
Supervisor(s)	Marko Siitonen

ABSTRACT

The rapid expansion of virtual reality (VR) has created increased demand for effective design practices for digital environments. This study examined the applicability of feng shui, an ancient Chinese system of spatial harmony, as framework for VR level design.

The objective of the thesis was to explore how feng shui principles could be adapted for use in virtual spaces, and to assess their potential for enhancing user experience. The study aimed to develop design guidelines and demonstrate their practical application through a proposed redesign of an existing VR game level.

Qualitative methods were used to analyze spatial design principles in both feng shui and VR game level design. The concepts were then combined and adapted to create guidelines, that were subsequently applied in a case study involving static defense VR first-person shooter game level. The research focused on spatial layout, wuxing, and object placement.

The study showed that feng shui principles, while generally aligning with conventional VR level design practices, could offer a valuable new perspective. While traditional feng shui emphasized harmony, certain imbalances were interpreted as beneficial to gameplay. The findings suggested that feng shui could help in the design of more engaging and atmospherically coherent virtual spaces when used with contextual adaptation.

Keywords: virtual reality, level design, environment design, feng shui, spatial design, game environments

CONTENTS

1 INTRODUCTION

Virtual Reality (VR) technology is rapidly transitioning from a specialized niche into a globally influential market. Valued at over $29 billion in 2023, with projections suggesting a compounded annual growth rate of 22.9%, VR market is suggested to be exceeding $187 billion by 2032 (Precedence Research 2024 cited in Wen 2024). As VR is adopted by diverse industries and is increasingly integrated into everyday life, it is expected to be shaping how people live, work and play. Consequently, the design of the virtual spaces themselves gains increased importance. Creating spaces that are comfortable, engaging, and intuitive will be essential in ensuring user satisfaction and the long-term success of the medium.

Good level design is more than simply creating functional layouts. It is shaping the player experience through atmosphere, spatial arrangement, and flow. Traditionally, level design draws upon principles of architecture, environmental psychology, and established gameplay conventions. This thesis, however, investigates the application of an unconventional source of inspiration, the ancient Chinese practice of feng shui. The basic goal of feng shui is to harmonize individuals with the environment they are in by carefully arranging space and objects to guide the flow of energy in desired ways. *Both feng shui and level design, therefore, share a fundamental focus on regulating energy and experience within a defined space.* Given this overlap, application of feng shui principles could be beneficial in the design of virtual spaces, particularly in the aesthetic and spatial qualities that affect player experience and comfort.

An ongoing debate regarding the scientific legitimacy of feng shui persists, partly due to its roots in Daoist cosmology, which differs significantly from Western scientific frameworks (Jin & Juan 2021, 2). Feng shui integrates Chinese philosophy, religion, astrology, cosmology, mathematics, and geography, making direct empirical validation challenging. However, recent research has begun evaluating feng shui through the lens of psychological and physiological human comfort. Jin and Juan (2021) conducted a study using VR technology, constructing two virtual environments, one designed with feng shui and one

without. The study observed a measurable physiological difference in participants between the two scenarios. These findings suggest that feng shui principles, regardless of their cosmological origins, have a tangible and measurable effect on individuals within virtual spaces. (Jin and Juan 2021.) This provides a compelling rationale for investigating their potential application in VR level design to shape player experience.

Building on recent insights into the tangible effects of feng shui in virtual environments, this thesis is motivated by the rapid expansion of VR and the potential to enhance VR level design by integrating feng shui principles. This involves adapting traditional spatial concepts for digital environments and exploring how the underlying cultural and psychological aspects of feng shui might translate into virtual interactions. Investigating this intersection is significant because it addresses current challenges in VR environment design and promotes innovation by introducing non-Western design philosophies to a broader range of designers. Moreover, it offers practical strategies for enhancing player immersion, comfort, and emotional response, and contributes to the wider academic discussion on applying traditional design wisdom to contemporary digital contexts.

The primary objective of this thesis is to explore the practical application of feng shui principles within VR level design, with the goal of developing actionable insights for designers. Specifically, the study aims to:

1. Identify key feng shui principles applicable to the aesthetic and spatial characteristics of VR environments.
2. Develop guidelines for incorporating these feng shui principles into the VR level design process.
3. Apply these guidelines by proposing specific modifications to an existing VR game level, *Whacking Woodfellas*, and evaluate the practical possibilities and challenges from the perspective of a designer.

To achieve these objectives, this research seeks to answer the following questions:

- What are the key feng shui principles relevant to designing VR environments, particularly in relation to spatial layout, object placement, color, and flow?
- How can these traditional principles be effectively adapted and translated to the context of virtual reality?
- How can feng shui principles be practically integrated into the VR level design workflow to enhance player experience?

To explore these questions, this study takes a qualitative approach, moving through three main stages. First, a contextual study reviews existing literature on VR level design fundamentals and feng shui principles. Second, insights from the contextual study are synthesized into practical guidelines for applying feng shui principles into VR level design. Third, these guidelines are applied by proposing modifications to a specific VR level case study. This last stage serves to evaluate how feasible the implementation is and highlights where feng shui principles might support or conflict with typical level design considerations.

The scope of this research is limited to the theoretical adaptation and practical application of the aesthetic and spatial aspects of feng shui. It does not extend to empirical user testing of the proposed modifications. Instead, evaluation is based on design analysis, providing groundwork for future studies that could incorporate player feedback.

Applying principles from a specific cultural tradition like feng shui requires careful consideration and respect. This research acknowledges the cultural significance of feng shui and seeks to avoid superficial interpretations. The focus is on the functional and experiential aspects of spatial arrangement suggested by feng shui, rather than its cosmological or spiritual dimensions, which would require a deeper study to explore fully. Furthermore, ethical responsibility is maintained regarding the potential impact of design choices on player comfort and emotional state in VR environments.

2 CONTEXTUAL STUDY

2.1 Feng Shui

Feng Shui is an ancient protoscience that originated approximately 6000 years ago in Neolithic China (Moran et al. 2005, 7). The Mandarin term feng shui directly translates to “wind-water”, reflecting the origin of the practice in the observation of natural elements that direct the flow of vital energy (qi) into an area (Moran et al. 2005, 8). Originally based on balancing the interaction of time and space, known as heavenly and earthly forces in the Chinese cosmology (Moran et al. 2005, 8), feng shui has evolved over time into a complex system integrating various disciplines such as astronomy, geography, philosophy and human behavior (Mak & Ng 2005, 427). Comprehensive in scope, feng shui offers a framework for architectural and environmental design that spans the entire process from urban planning to interior design (Mak & Ng 2005, 427). Classical feng shui is a methodical approach to spatial planning that involves a comprehensive analysis of the environment, including the landscape and the orientation of landscape elements within the space, supplemented by consultation of classical literature. Its objective is to place structures in harmony with the natural flow of the land. (Xu 2022, 197.)

Feng shui is often misunderstood in Western cultures due to oversimplification and inauthenticity of many popular interpretations. Contrary to common stereotypes of superstition and pseudoscience, feng shui is a sophisticated framework deeply rooted in observational methods and has historically been used to assess local bioclimatic conditions. (Bramble 2003, 36; Moran et al. 2005, xv, 7.) According to Bramble (2003, 36), feng shui methods apply rules and mathematical formulas to all things in order to generate data free from preconceived biases for analysis. Furthermore, Bramble (2003, 38) suggests that feng shui, as a form of Chinese divination, calculates probabilities and can be considered an ancestor of complexity theory.

A comprehensive evaluation of the landscape in feng shui requires consideration of three primary elements: the physical features of the environment, the flow of

land and water, and the directional and vicinal influences. Mountains, water bodies, and built environment are analyzed according to their shape, position, and type. (Bramble 2003, 73.) In urban contexts, buildings and roads can be interpreted as natural features, with buildings representing mountains and valleys, and roads representing waterways (Bramble 2003, 73; Moran et al. 2005, 38). Furthermore, compass readings offer additional insights into the potential and characteristics of a site (Bramble 2003, 72).

The traditional Chinese worldview forms the philosophical foundation upon which the principles of feng shui are based. Central to this worldview is the concept of interconnectedness among all things. The universe is perceived as a cohesive system wherein all elements exist in a dynamic interplay of energy, influencing and resonating with one another. These interactions generate effects analogous to the butterfly effect. (Bramble 2003, 18; Moran et al. 2005, 1.) The harmonious environments promoted by feng shui are intended to encourage positive interactions of energy and mitigate negative ones, thereby enhancing the well-being and prosperity of individuals by strategically positioning them in optimal locations at opportune times (Moran et al. 2005, 53).

Feng shui is traditionally divided into two primary branches: the Form School and the Compass School (Zhao et al. 2023, 2). These schools differ in their methodological approaches and focal points. Specifically, the Form School is characterized by its focus on the discernible physical attributes of the environment, while the Compass School emphasizes the integration of cosmological and metaphysical constructs (Mak & Ng 2005, 427; Moran et al. 2005, 39; Zhao et al. 2023, 2). This distinction underscores a fundamental tension within feng shui between empirical observation and abstract theoretical frameworks.

2.1.1 History of Feng Shui

Early human societies recognized a fundamental interdependence between their well-being and the forces of nature. This awareness led to the development of practices aimed at establishing a connection with and harnessing these forces.

(Jafari 2024, 53.) Within this framework, the concept of dao emerged. Dao, the foundational principle of Daoism, represents the totality of existence, forming a comprehensive cosmic framework wherein all phenomena are interconnected and mutually resonant. (Bramble 2003, 18.) Daoist principles of harmony, peace, and equilibrium between the self and the external world serve as the philosophical origins of feng shui (Jafari 2024, 53).

The origins of feng shui practice can be traced to a form of divination known as ‘The Way of Heaven and Earth’ during the Warring States Period (493-221 BCE). Feng shui was subsequently formalized during the Eastern Jin Dynasty (317-420 CE), when the *Book of Burial* employed the term to describe the distribution of qi across the terrestrial landscape. (Moran et al. 2005, 37.)

Over several centuries, feng shui became an integral component of Chinese architecture, with the design of numerous major cities in China reflecting its principles (Mak & Ng 2005, 430). The practice also spread beyond China, influencing similar systems such as *Pungsu* in Korea and *Fusui* in Japan. However, during the New Culture Movement of the 1910s and the Cultural Revolution of the 1960s, efforts to eradicate traditional practices within China led to the proscription of feng shui and its criminalization, significantly diminishing its influence. (Jin & Juan 2021, 2.) Despite these historical challenges, feng shui persists in many parts of the world. Its principles, exhibiting a remarkable degree of historical consistency, continue to inform architectural, interior design, and urban planning practices, effectively bridging ancient epistemologies with contemporary applications. (Zhao et al. 2023, 6; Jafari 2024.)

The enduring relevance of feng shui reinforces its potential applicability to VR level design. By understanding the history and evolution of this practice, the research aims to ensure appropriate respect for its cultural significance throughout the study.

2.1.2 The Two Schools of Feng Shui

The Form School, the oldest acknowledged branch of feng shui, is recognized as the more empirically grounded of the two primary schools (Mak & Ng 2005, 427). Its methodology centers on analysis of physical environment features such as mountains and rivers, to determine optimal building sites and orientations conducive to favorable qi flow (Mak & Ng 2005, 428). Architecturally, the Form School focuses on four main elements: the external environment, form of the building, the internal space configuration, and the scale and proportions of the structure. Additionally, the internal spatial design must ensure adequate lighting and ventilation for optimal functionality. (Zhao et al. 2023, 6.) Methodologies of the Form School have stood the test of time, as evidenced by architectural practices in cities such as Sydney and Hong Kong, where structures, both intentionally and unintentionally, align with feng shui principles (Figure 1) (Mak & Ng 2005, 427, 432).

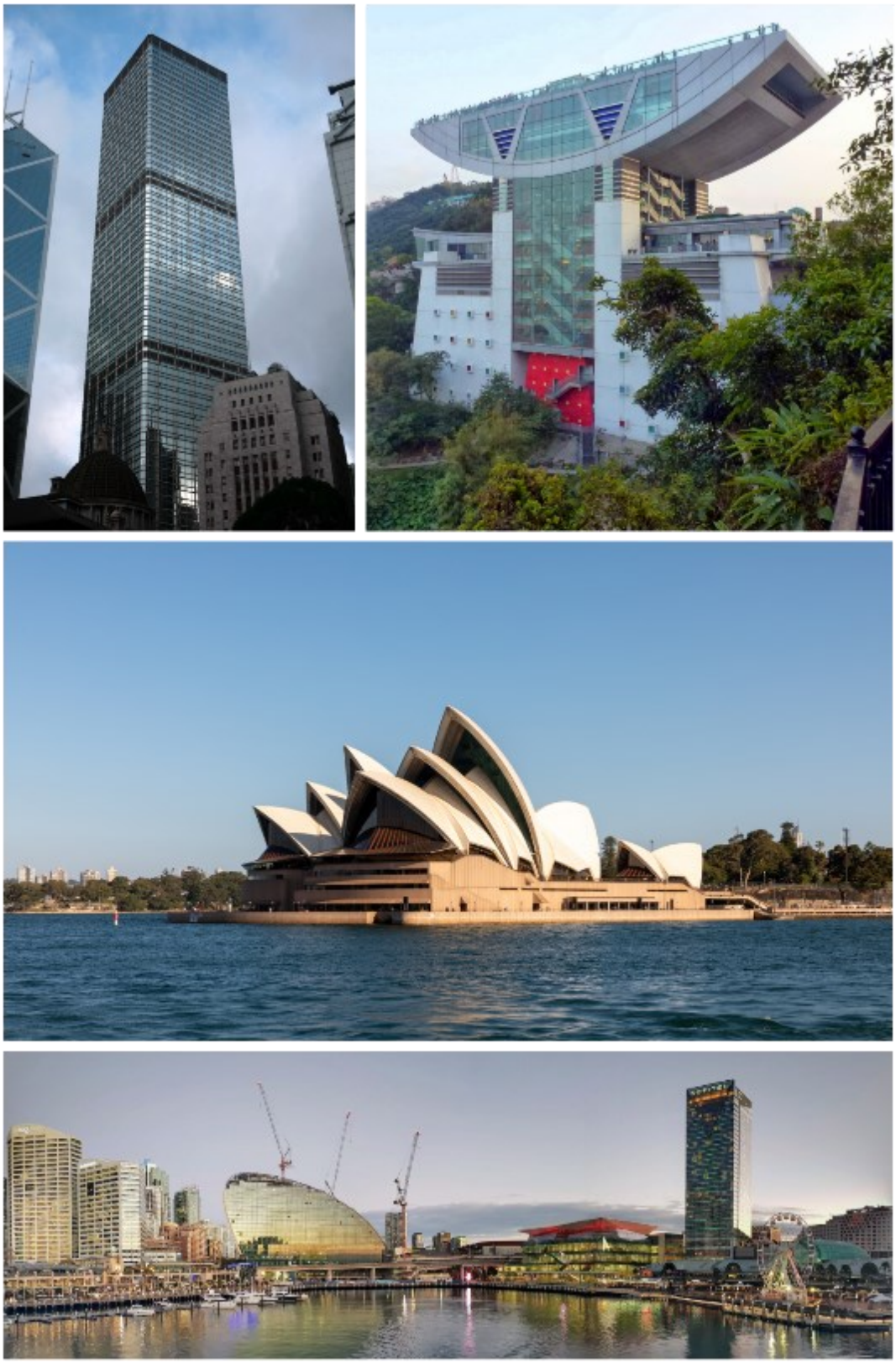

Figure 1. From left to right, top to bottom: Cheung Kong Center, Hong Kong (The Cheung Kong center in Hong Kong (5th Tallest Building in Hong Kong) 2006), Peak Tower, Hong Kong (Maksimovich, N. 2014), Sydney Opera House (Rabich, D. 2019) and Darling Harbour, Sydney (Kozlenko, M. 2001)

The landforms central to the Form School theories are deeply rooted in ancient Chinese cosmology. While this research is staying away from the cosmological and metaphysical aspects of feng shui, understanding the origin of certain terms is important in ensuring respectful application.

According to traditional narratives, a primordial state of perfect equilibrium existed between heaven and earth, characterized by eight mountains delineating the eight cardinal directions. This harmonious state was disrupted by a mythic conflict between the water demon *Gong Gong* and the fire god *Zhu Rong*, culminating in the collapse of *Mount Buzhou*, the northwest pillar. This cataclysmic event resulted in the transformation of four deities into terrestrial archetypes, each representing a cardinal direction: the Vermillion Bird in the south, the White Tiger in the west, the Black Turtle-Snake in the north, and the Azure Dragon in the east. (Moran et al. 2005, 112-113.)

According to Zhao et al. (2023, 6), the foundational tenets of the Form School prescribe a sequential methodology (Figure 2)

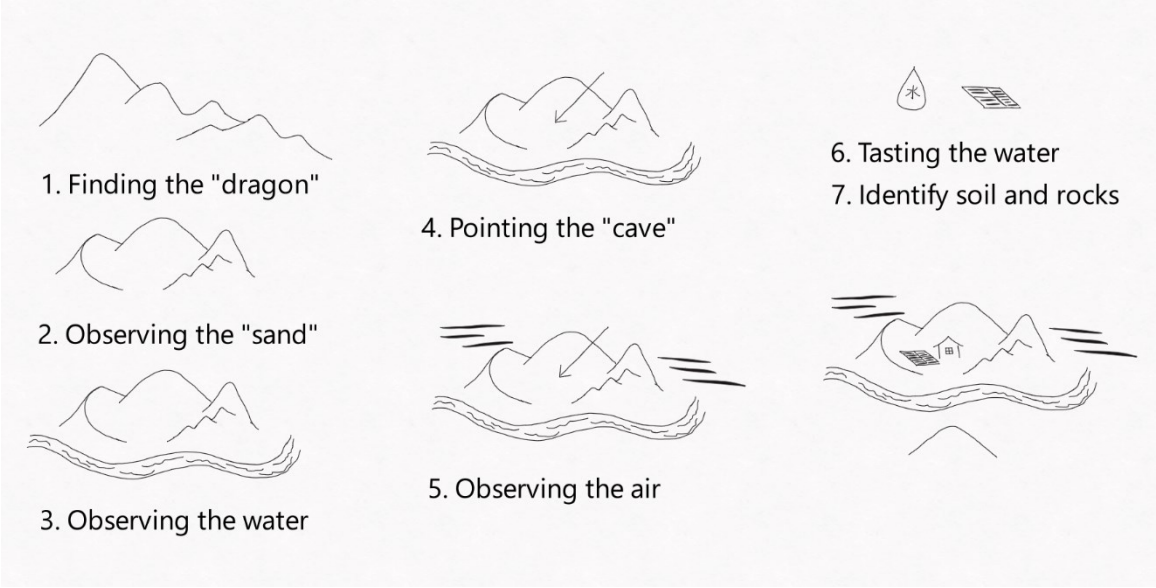

Figure 2. The sequential methodology as prescribed in the Form School.

.

The process of “finding the dragon” entails locating a mountain ridge that originates from a peak and extends into a chain of at least three additional

mountains, culminating at a descent to the “cave”. The auspiciousness of the building site is directly correlated with the elevation of the peak and the length of the ridge. (Mak & Ng 2005, 429.) Conversely, “violent dragons”, mountains characterized by steep, narrow canyons and sharp topographical features, and “sick dragons”, mountains with concave basins, are deemed inauspicious. These formations are associated with potentially catastrophic events, such as debris flow, and are therefore to be avoided. (Xu 2022, 198.) In terms of VR space, “auspiciousness” can be correlated to comfort. A space with a well-shaped dragon is comfortable and safe whereas a space with violent or sick dragons will create tension.

“Sand” refers to the mountains and hills surrounding the space. An ideal sand consists of a prominent Azure Dragon in the east, an elongated White Tiger to the west, and a Black Turtle-Snake positioned at the rear of the space in the north (Mak & Ng 2005, 429; Moran et al. 2005, 116). Furthermore, optimal sand arrangement exhibits symmetry between the Azure Dragon and the White Tiger, converging at the entrance of the space in the south (Zhao et al. 2023, 6). Traditionally, sand serves both symbolic and functional purposes, effectively shielding the site from prevailing winds. In VR environment, it would contribute in framing the space.

Water, ideally situated to the south of the site, should exhibit dynamic movement, avoiding stagnation, linear flow, or excessive velocity. In contemporary interpretations of feng shui, roadways carrying the flow of traffic are often considered analogous to watercourses. (Bramble 2003, 76; Mak & Ng 2005, 429.) This opens a lot of possibilities for what could be interpreted as a watercourse in VR.

“Cave” represents to the ideal location for a dwelling within a space. Its identification constitutes the primary objective of the Form School. (Mak & Ng 2005, 429.) Contemporary psychological perspectives suggest that a sense of security and inner peace is fostered by a protective surrounding, potentially rooted in the fetal experience within the amniotic environment. The Form

School's emphasis on surrounding the "cave" with "sand" aligns with this psychological need. (Zhao et al. 2023, 1.) Therefore, a location aligning with the concept of a "cave" would also offer a feeling of safety inside a VR environment.

As mountains offer protection from the wind (feng) and an adequate water (shui) supply is necessary for survival, one of the core principles of the Form School is that a building should face away from mountains and towards water (Jin & Juan 2021, 1). This sounds reasonably applicable for VR environments too despite the missing natural forces. Beyond the water feature, a proximate hill or distant mountain, symbolizing the Vermillion Bird, is considered auspicious (Mak & Ng 2005. 429).

The Compass School, also known as the *Liqi Pai* or Patterns of Qi School, contrasts with the Form School by focusing on the integration of temporal and spatial dimensions through the use of the *Luopan*, a specialized compass (Mak & Ng 2005, 428; Moran et al. 2005. 39). The methodology of the Compass School incorporates mathematical formulae and astrological principles to determine favorable spatial layouts, based on factors such as the year of construction and the birth year of the occupant. Contrary to Western perceptions of feng shui as primarily intuitive, this school relies heavily on empirical observation and experimentation. (Mak & Ng 2005, 428; Moran et al. 2005, 29; (Jin & Juan 2021, 1.) This approach renders the Compass School less applicable to pre-fabricated levels, but potentially relevant for procedural generation. It also highlights the inherent flexibility of classical feng shui, where no single configuration is universally applicable (Moran et al., 2005, p. 71).

2.1.3 Legitimacy of Feng Shui

Although feng shui principles are frequently observed in contemporary architectural and interior design practices, particularly within South and East Asia, scholarly discourse continues to debate the extent of their direct influence on human subjects, with a notable paucity of empirical research (Jin & Juan 2021, 1). In an attempt to address this gap, Jin and Juan (2021) conducted an AB-testing study within a virtual reality (VR) environment, employing Heart Rate

Variability and the Profile of Mood States as metrics. Their findings indicated that VR indoor scenes incorporating feng shui principles elicited positive emotional responses and feelings of comfort among the participants. (Jin & Juan 2021, 6-7.)

Similarly, a separate study conducted over a 15-year period at a Swedish hospital revealed that wall art with natural imagery fostered positive responses, whereas abstract or contemporary art exhibited no discernible effect (Bramble 2003, 113). While this study did not explicitly investigate feng shui, the emphasis of the practice in achieving harmony with the natural world suggests a potential correlation between the observed positive effects and feng shui principles.

Research has demonstrated a notable convergence between feng shui and contemporary architectural design standards. Specifically, site selection and spatial layout methodologies within contemporary architecture frequently align with traditional feng shui theories. (Mak & Ng 2005, 432; Jin & Juan 2021, 2.) In 2001, So and Lu (as cited in Mak & Ng 2005, 428) employed computational fluid dynamics to illustrate that natural ventilation patterns of bathroom design correspond with the concept of qi flow. Additionally, a 1998 study by Mak (as cited in Mak & Ng 2005, 430) indicated that 14 out of 20 major global cities exhibit conformity with feng shui theory and its ideal compositional principles.

Environmental psychology, a relatively recent subfield of applied social psychology, examines how the physical environment influences human behavior and psychological processes (Hui 2022, 4). Its primary focus lies in analyzing the interactive dynamics between individuals and their environment, with the aim of translating acquired knowledge into strategies for enhancing individual well-being and improving human-environment interactions (Hui 2022, 15). This conceptual framework demonstrates a strong parallel with the fundamental principles of feng shui. As Hui (2022, 55) observes, traditional Feng Shui prioritizes the achievement of harmonious coexistence between individuals and their environment, a purpose that closely resonates with the objectives of environmental psychology.

Biophilic design endeavors to cultivate a connection between humans and the natural world by incorporating natural elements into built environments, with the explicit goal of enhancing well-being and productivity (Mollazadeh & Zhu 2021, 4). Research exploring the psychological and cognitive benefits of natural and biophilic environments has consistently demonstrated enhanced cognitive performance, positive affective responses, increased productivity, and a reduction in stress and fatigue (Mollazadeh & Zhu 2021, 1). Considering that the fundamental principles of feng shui revolve around harmonious coexistence with nature, it is logical to infer that these benefits would extend to feng shui practices. The efficacy of biophilic design remains an area of active research (Mollazadeh & Zhu 2021, 2), potentially yielding further insights into the beneficial effects of feng shui as well.

2.1.4 Concept and Definition of Qi

Qi is posited as the fundamental, unifying vital force and substance permeating all phenomena. It is characterized by its dynamic and perpetual state of flux, constantly moving and transforming, manifesting as wind (*feng*) and being retained by water (*shui*) (Moran et al. 2005, 43). The concept of qi has drawn parallels with modern quantum physics, as it is not merely an intrinsic essence of material objects but also the mediating force governing their interactions (Moran et al. 2005, 42).

Qi can manifest as yang-aligned, characterized by warmth, dynamism, and life-generating qualities or yin-aligned, characterized by coldness, stasis, and life-inhibiting properties (Mak & Ng 2005, 428). Positive qi, termed *sheng qi,* fosters harmony and is perceptible through comfortable sensory experiences, such as aesthetically pleasing visuals or auditory stimuli, smooth textures, warm thermal sensations, and satisfying tastes. Conversely, negative qi, or *sha qi,* disrupts harmony and is discernible through disagreeable sensory experiences, including glaring lights, auditory pollution, clutter, and offensive olfactory stimuli. Furthermore, “poison arrow qi”, also designated “killing breath”, denotes deleterious energy channeled along linear trajectories, such as sharp architectural corners or opposing doorways. (Moran et al. 2005, 51-52.)

2.1.5 Wuxing and How the Five Phases Influence Spatial Design

The principle of the five phases, or wuxing, is a key component of feng shui. Formed over time to explain the cyclical flow of qi between yin and yang (Moran et al. 2005, 65), wuxing also provides a conceptual framework for comprehending how the different qualities within objects and environments interact to create predictable patterns (Bramble 2003, 23). In ancient Chinese cosmology, these interactions were considered the foundation of all existence (Moran et al. 2005, 66). Consequently, wuxing plays a pivotal role in analyzing how parts of a system relate to each other and influence movement and change (Bramble 2003, 23).

Each phase of wuxing represents a different type of qi and has unique ways of interacting with the others (Bramble 2003, 23; Moran et al. 2005, 66). Represented by five elements, wood, fire, earth, metal, and water, each phase symbolizes different type of movement and transformation found in nature (Bramble 2003, 23). Specifically, fire qi is linked to radiating energy, earth qi to compacting, metal qi to contracting, water qi to flowing downward, and wood qi to growing upward (Moran et al. 2005, 66). Interactions between the phases form a repeating cycle that can be seen in natural and scientific processes. For example, water condenses on metal surfaces, and fire turns water into steam through heat. (Bramble 2003, 23.)

Wuxing is divided into four different cycles based on the effect the phases have on each other. The productive cycle shows how each phase naturally leads to the next, creating harmony and balance (Figure 3). Water nourishes wood, wood fuels fire, fire burns wood to create earth, earth forms metal by compacting and water condenses on the metal (Moran et al. 2005, 68-69.) In contrast, the controlling cycle describes how the phases dominate and suppress each other, leading to disharmony and imbalance that disrupts the natural flow of qi (Figure 3). The weakening cycle (Figure 3) can be used to rectify this imbalance. It blends ideas from both the productive and controlling cycles, functioning as a stabilizer to maintain balance. (Moran et al. 2005, 69-70.) Utilizing wuxing can be more complicated than it seems on surface level. To create harmony, on top of

finding the right balancing element, it is important to make sure the phases work together rather than against each other (Moran et al. 2005, 73).

As the harmony and balance brough by wuxing should directly translate to comfort levels, using the principle when designing the colors and materials in a VR environment is worth exploring. Utilizing disharmony and imbalance of the phases to create tension is also an intriguing concept. While it goes against the fundamental goal of feng shui, it could offer new ideas for designing the variety of atmospheres game levels require.

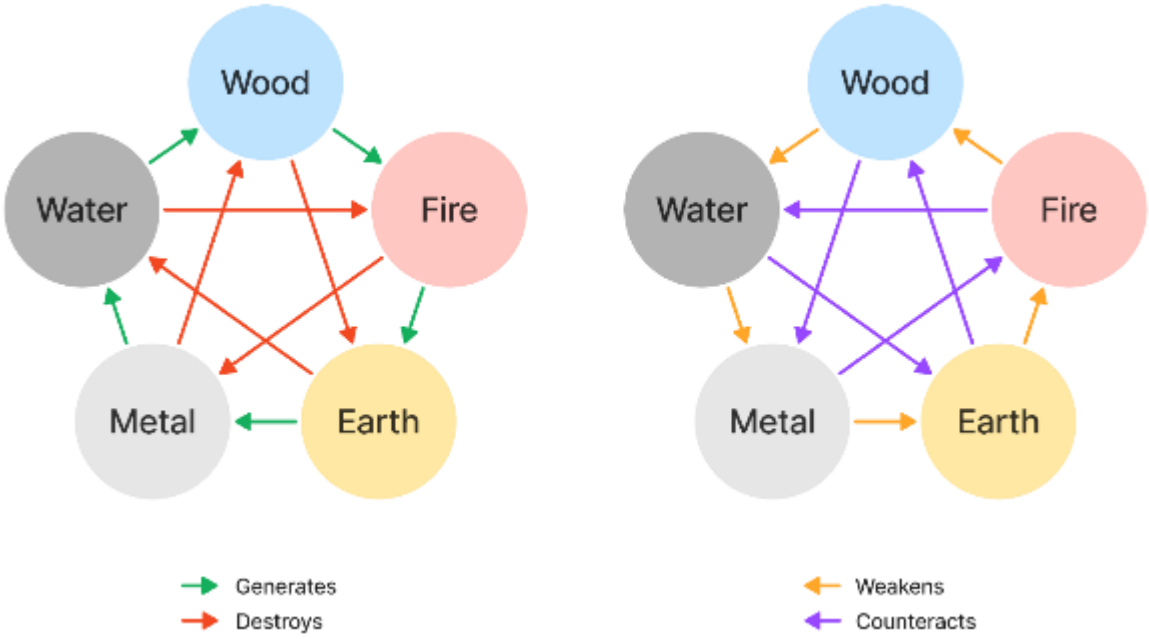

Figure 3: The four cycles of wuxing.

The principles of wuxing extend beyond the cycles of interaction. Each phase corresponds to a geometric shape that influences the flow of energy within a given space. Triangular buildings are associated with fire qi, square and rectangular ones with earth qi, circular or domed buildings with metal qi, and wavy shapes with water qi. Tall, vertically expansive structures like skyscrapers, embody wood qi. The way these shapes influence energy flow within a space can either enhance or disrupt its atmosphere. For example, circular buildings, such as the Guggenheim Museum in New York, encourages visitors to follow along a circular path. (Moran et al. 2005, 77.) Naturally, the influence the shape of a space has transfers very well to VR, making this aspect of wuxing applicable.

Notably, contemporary architecture, often including sharp angles and a neglect of natural elements, cause stress and a sense of unease. (Bramble 2003, 117.) This effect is further enhanced in cities where wildlife and greenery can be completely absent, leading to what Bramble (2003, 117) calls the “wretched urban viewshed”. Turning away from the traditional building forms found in wuxing and ignoring the natural flow of energy can culminate in the creation of hostile and disorienting spaces (Bramble 2003, 117). Of course, this is a very beneficial insight for designing game levels when this kind of atmosphere and experience is desired.

2.1.6 The Theory of Yin and Yang

Ancient Chinese cosmology describes the existence of an Absolute, known as Taiji, or Supreme Ultimate. Within Taiji resides a fundamental duality: yin, representing the feminine aspect of nature, darkness, and negativity, and yang, representing the masculine side, light, and positivity. (Xu 2022, 196-197.) These terms originally referred to the shaded (yin) and sunlit (yang) sides of a hill but later evolved to symbolize the two primal forces of qi during the mid to late Zhou Dynasty (770-481 BCE) (Moran et al. 2005, 57).

The relationship between yin and yang goes beyond simple opposites. It represents the constant motion and transformation found in nature. (Bramble 2003, 19, Moran et al. 2005, 61.) Nothing is purely yin, nor purely yang. This balance can be seen in the natural cycles of night turning into day and death giving way to new life (Moran et al. 2005, 60.) In their purest forms, yin is matter and yang is immaterial energy, similar to the first law of thermodynamics, where energy and matter are constantly transformed into each other (Bramble 2003, 20.)

In the context of space, yin is typically associated with the quiet, secluded areas without many openings, whereas yang dominates the more active areas with movement, such as entrances and windows (Jafari 2024, 46). In practical application, balancing yin and yang often aligns with common-sense adjustments,

for example adding light to a dark space and curtains to a room that is too bright (Moran et al. 2005, 64).

2.2 Virtual Reality

Driven by the increased demand for immersive experiences and improvement in device accessibility and usability, virtual reality (VR) has seen a rapid rise in mainstream adoption in recent years (FXMedia Team 2024). The biggest advantage VR games have over traditional video games is their ability to reach a level of immersion that flat-screen games simply cannot match. By allowing players to move within a 3D environment using motion sensors and adjusting the view in real time combined with haptic feedback and 3D spatial audio, VR delivers a multisensory experience that tricks the brain into feeling truly present in the virtual space. (FXMedia Team 2023; Wen 2024.)

2.2.1 Designing Levels for Virtual Reality

While level design generally refers to creating a sequence of spaces that form a level (Totten 2014, xxvii), this thesis also uses the term to encompass certain aspects of environmental art, which refers to the aesthetics of the game space, as it overlaps with feng shui.

Level design is a complex discipline within game development, with many challenges and no universal methods. Rudolf Kremer defines level design as interpreting the game rules and translating them into a space that best fosters the act of playing. Skilled level designers additionally make use of spatial flow to enhance the experience the player has moving through that space. (Totten 2014, xxiv.) A well-designed game level should offer a compelling experience that enables the player to interact meaningfully with the space, while clearly communicating objectives and guiding the actions of the player through visual and spatial cues alone (Saaristo 2020, 11).

Although VR level design diverges from traditional level design in certain technical and experiential aspects, many core principles remain applicable (Saaristo 2020, 7). However, the technology does also pose unique challenges. Unlike traditional video games, VR is inherently a physical experience, which means many of the conventional game design methods do not lead to the expected results. Many early VR games were adaptations of popular existing concepts, but it has become evident that VR requires ideas that fully utilize its strengths. (Dealessandri 2020.) Using feng shui to design virtual spaces would effectively do this, as being in a VR space is closer to being in a physical location in experience than playing a traditional video game.

Immersion, presence, spatial perception and interaction are the four crucial characteristics of a virtual environment (Mollazadeh & Zhu 2021, 6; Azarby & Rice 2022, 3). In VR, immersion refers to the user experience of being part of and being able to directly interact with the environment (Azarby & Rice 2022, 4). Presence on the other hand refers to the sense of being in the space the virtual environment suggests, rather than the physical space the user is in (Mollazadeh & Zhu 2021, 6). To reach a state of immersion and presence, the user needs to be able to orient themselves and feel a sense of connection within the space (Totten 2021, 5). This thesis proposes that utilizing feng shui could aid in that.

2.2.2 Level Design and Architecture

Vision is the sense humans rely on the most to gather information, making the visual aspects of a virtual environment the most impactful sensory stimuli for immersion, presence and overall spatial experience in a virtual environment (Mollazadeh & Zhu 2021, 7, 13). Interaction further enhances immersion by allowing users to navigate and manipulate the environment, reflecting time and space within the virtual setting (Azarby & Rice 2022, 4). By integrating immersion with interaction, the experience of presence is constructed (Azarby & Rice 2022, 3). Thus, the design of game levels can be better understood by examining real-world environments designed for human interaction, such as architecture, urban environments and gardens (Totten 2014, xxii).

Both level design and architecture share a focus on integrating space, time, and sensory information to shape the user interactions on both physical and cognitive levels, fostering both positive and negative emotions (Totten 2021, 2). Just as architects guide navigation and interaction within a space, level designers guide the experiences of the players within virtual environments (Totten 2021, 7). All of this aligns rather well with feng shui. This shared focus on shaping user experience through indirect control results in engaging and satisfying experiences (Schell 2020, 396).

Architecture has commonly been used in game development as a surface-level visual reference. However, historical architecture also offers many lessons in composition of space. It can be used to study placement of sightlines, ways to control the movement and activity of occupants, and how level design can be used as a narrative tool. (Totten 2014, XXII, 1, 45.) Seeing as how most if not all historical buildings in China and many other East-Asian countries implement some form of feng shui, the usefulness of historical architecture as a teacher reinforces the potential feng shui has as a level design tool.

Because the camera view in VR generally has a wider field of view than traditional video games, and reducing the camera control creates discomfort (Dealessadnri 2020), developers have to rely on probability when determining where the player is looking at a given time (VR Design Principles, n.d.). This means guiding the attention of the player with level design is increasingly important (Dealessandri 2020). Therefore, games played in first-person perspective, like VR games, where players have full control of the camera, benefit the most from employing a wide variety of architectural strategies for directing attention (Totten 2014, 146).

A significant difference between architecture and level design is that real life structures are usually designed to foster positive emotions. Architecture has a set of rules for both things to do and things to not do to serve this purpose. A level designer, however, might want to also create an experience invoking negative

emotions like fear in their players. Looking at the architectural rules to realize that experience could be beneficial. (Totten 2014, xxv.) Similarly, looking at what makes a space harmonious and what brings imbalance in feng shui could be used to enhance the intended emotional and experiential outcomes.

Due to the similarities in architecture and level design, and the increased importance of managing user attention in VR, it is worth considering how ancient spatial practices like feng shui can be utilized to further enhance virtual environment. Feng shui, like architecture and level design, focuses on the arrangement of space to guide energy flow and evoke emotional responses, offering another rich framework to consider when designing immersive VR environments.

2.3 Designing Flow: Spatial Organization in Level Design and Feng Shui

Spatial flow refers to the ways in which a space guides movement and influences perception and emotion. It involves clarity of pathways, rhythm and pacing of movement, and the impact of sensory stimuli like visuals and audio. A well-designed spatial flow ensures ease of navigation and creates a compelling sense of place, enhancing the player experience.

2.3.1 Feng Shui as System of Spatial Flow

In VR environments, where a space is perceived more viscerally than on a flat screen, spatial flow has a heightened importance. Therefore, understanding systems like feng shui, which consider space and movement interconnected, offers interesting perspectives for creating intuitive and atmospheric VR experiences. By examining how feng shui manages spatial flow, designers can better understand how to subtly guide players, influence emotions, and foster a deeper sense of presence.

Feng Shui is fundamentally based on the concept of a constant flow of energy, or qi, between an individual and their surrounding environment (Jin & Juan 2021, 2). The primary objective of the practice is to balance this flow of energy by

harmonizing design elements with nature (Bramble 2003, 79). For example, a garden designed in accordance with feng shui principles seeks to present an accurate representation of the qualities inherent in nature (Jafari 2024, 51).

The orientation of buildings similarly reflects an adherence to the natural contours of the land. A structure situated on an incline should receive support from higher ground while facing flatter or lower terrain (Bramble 2003, 80). On level ground, buildings should face elevated landforms or taller adjacent structures (Bramble 2003, 81). In proximity to water, facing the water source is ideal. This is because it is thought that the waterway brings qi to the area. The optimal configuration features a mountain at the rear of the building and a body of water in front. (Bramble 2003, 81.) In VR level design, a structure or building can be likened to a section of gameplay. Therefore, it could be said that upon entering a section of gameplay, the player should have a “watercourse” behind them and a “mountain” ahead of them, at the back of the section.

Entrances are particularly important in the flow of qi. A well-maintained and adequately illuminated main entrance draws in positive qi. Additionally, energy should follow a curved path when entering a space, as straight lines are rare in natural environments. Once inside, qi must be able to circulate freely without obstruction. (Moran et al. 2005, 128-129; Jafari 2024, 47-52.) In VR, entrances and transitional spaces set the tone of a space. A well-lit, open entrance evokes feelings of safety and welcome in the player, whereas a dark, cramped entryway triggers tension. The elevation of the main entrance in relation to the outside space also influences subconscious perceptions of safety. An entrance positioned at an elevation creates a sense of security, whereas one situated at a depression fosters feelings of vulnerability and confinement. The space directly inside the entrance is also important. An entrance opening onto a stairwell or aligning with the exit enables qi to exit the space rapidly, preventing its effective circulation. (Moran et al 2005, 129.) This makes great sense in level design too as a space with a linear path through it encourages the player to exit the area quickly, discouraging exploration and therefore not providing an engaging experience.

The shape of the space further affects the flow of qi within. Square and rectangular spaces are considered the most favorable, providing a stable path for the energy to bounce between walls. In contrast, circular spaces cause qi to spiral uncontrollably, while the sharp corners of a triangular space produce chaotic movement, leading to feelings of claustrophobia, anxiety and stress. (Moran et al 2005, 126-127; Xu 2022, 200.) Understanding how qi flows in different spatial shapes can inform more comfortable and easier to navigate virtual environments.

Entrances, curved pathways, and elements associated with water maintain the movement of positive qi. This can be further enhanced with elements like lamps, mirrors, statues, natural sunlight, fresh plants, the removal of clutter and the absence of sharp objects (Jafari 2024, 54). However, it is important to keep the balance of wuxing and ying-yang in mind when introducing objects into a space.

The direction and elemental association of the flowing qi influence the kind of energy it brings to a space. Southern fire qi is stimulating and mood boosting energy that fosters social activity and creativity but simultaneously decreases the ability to concentrate and think objectively. The qi aligned with water and the North support objective thinking but also creates calm, sleep inducing energy. The element of earth, associated with Southwest, Center and Northeast, brings attention and a sense of security, but can also promote lethargy and boredom. Metal qi, tied to the West and Northwest, supports the ability to manage finances, organize, and behave. However, it also suppresses movement and emotional expression. Finally, the Eastern and Southeastern wood qi provide generally positive influence, enhancing character, activity, seriousness, concentration, and creativity. (Jafari 2024, 47.)

For VR designers, utilizing the energy associated with different directions to inform gameplay flow could help with pacing and managing the experience across the level. Example of this could be placing action packed section in the southern fire region, a safe hub area in the central earth region and a vendor in

the western metal region. Understanding the principles that guide the movement of qi in feng shui gives insight on the impact of spatial organization on gameplay experience.

2.3.2 Level Design as a System of Spatial Flow

Space, as a game mechanic, is a mathematical construct that provides context for the rules and systems of a game (Azar 2013, Schell 2020, 166). Level design connects many individual spaces into a coherent gamespace with an intentional sense of spatial flow. Nassib Azar (2013) describes this connection through the concept of *Molecule Design*, where a level is composed of nodes and edges. Nodes are spaces where active gameplay happens with pick-ups, spawn points and opportunities for interaction, whereas edges are, sometimes, abstract spaces between nodes that define their relationships (Azar 2013).

A gamepace with effective flow consists of nested spaces, or molecules, rather than a singular flow of gameplay that defines the space as a whole (Azar 2013, Schell 2020, 170). The pacing of action also significantly affects spatial flow. Edges within molecules and the spaces between them serve to create quieter moments to balance the intensive gameplay, keeping the player from being overwhelmed (Saaristo 2020, 15).

2.3.3 Comparative Analysis of Spatial Flow in Level Design and Feng Shui

Both feng shui and level design focus on directing flow within a space, but with different approaches. Feng shui organizes flow based on existing natural forms, whereas level design creates forms based on the desired flow. Architecture historically channels occupant activity within a space, and level design continues this tradition, guiding players in a manner akin to directing the flow of qi.

Azar’s (2013) molecule design aligns closely with the concept of yin and yang. The nodes where intensive gameplay happens correspond to yang which presents in the active parts of a space, while the edges embody the quiet and calm yin. Just as feng shui seeks to balance yin and yang, molecule design

strives to balance nodes and edges. Combining these two concepts brings harmony to the spatial flow and pacing of a gamespace.

Different kinds of nodes could also be compared to the different phases of wuxing, suggesting that the wuxing system could be utilized to balance the variance of nested molecules within a gamespace. Furthermore, the structure of feng shui naturally harmonizes with the concept of nested molecules, as the qi flow of each room must be considered individually while also remaining part of a broader system.

According to Schell (2020, 172), simultaneously perceiving the abstract functional space and the aesthetic space, and understanding their relationship, allows level designers to make better choices during the design process. Schell (2020, 212) further states that balancing a game is fundamentally about understanding the relationships between the game elements and knowing which ones need to be altered and how much. This description closely mirrors how Moran et al. (2005) describe balancing wuxing. They state that identifying the correct remedying agent and ensuring that different phases complement, rather than contradict, each other is key to achieving harmony.

A significant difference between the flow of qi in real world and in a game world is that game worlds often consist of disconnected instances. In the real world, the inside of a house is always physically connected to the outside environment, but in game worlds, the two sides of a closed door can exist in entirely separate spaces (Schell 2020, 170). Azar (2013) also notes that thinking in pure spatial terms can hinder a designer from achieving their goals within a game space, whereas feng shui, with its flexible conceptualization of flow, does not encounter such limitations.

3 FORMULATING THE GUIDELINES

The absence of physical laws regulating virtual reality environments, while offering a certain degree of creative freedom, may result in user disorientation

and a diminished spatial understanding. The principles of feng shui, which emphasize energy flow and spatial harmony, provide a robust framework for the design of virtual spaces. Incorporating these principles aids in creating cohesive environments that promote intuitive interactions, ultimately enhancing user comfort and engagement. Although feng shui conventionally informs design in relation to pre-existing natural forms, in virtual reality, designers can utilize these same principles to shape virtual spaces that effectively guide and improve the desired flow within a game level.

The spatial experience of an individual is primarily influenced by their interpretation of the environment's qualities (Mollazadeh & Zhu 2021, 13). Feng shui draws upon common sense and subconscious associations. Thus, using feng shui as a framework for assessing spatial qualities can subtly and effectively guide the user experience. User behavior is also influenced by environmental stimuli, particularly when their interactions with specific environmental qualities are positively reinforced (Hui 2022, 17-19). The atmosphere of a space is shaped by the user's prior experiences with these environmental qualities (Hui 2022, 41), resulting in emotional fluctuation and corresponding behaviors. For example, a player is likely to avoid touching fire in a VR environment due to associating it with being hot.

3.1 The basic principles of Spatial Arrangement

In feng shui, the way qi enters a space is highly important, meaning special attention should be paid to the design of entrances and transitional areas the player encounters (Jafari 2024, 38). By making the player approach entrances along curved paths, following the flow of positive qi, level designers can strategically manage how the upcoming space is revealed. For example, the space beyond an entrance could be gradually revealed through openings along the curved path, allowing the player to anticipate the upcoming gameplay section. Alternatively, it could remain completely hidden until arrival, fostering a sense of discovery, tension, and surprise. The shape, materials and lighting of the entrance offer further opportunities to apply wuxing and yin-yang to influence the atmosphere of the transitional area. Beyond the use of doors and windows to

influence emotional experience, drawing attention to these elements can be used as an effective tool to guide player navigation, highlight areas of interest, or signal events such as enemy entry points within a virtual environment.

To create a level that feels comfortable, the space must be designed in a way that balances the phases of wuxing. This can be achieved by utilizing the cyclical framework (Figure 3) to apply appropriate phases to enhance, control and neutralize each other. (Jafari 2024, 53.) In contrast, to create tension, the designer might introduce a deliberate imbalance. A predominance of a specific wuxing phase could be used to evoke a corresponding atmosphere and emotion. For example, designing a space with excessive Fire could be used to create agitation. This can be accomplished while maintaining creative freedom by adding Wood to enhance the Fire energy while reducing the amount of phases that destroy (Water), weaken (Earth, and counteract (Metal) it. Another important aspect to balance for the desired experience is ying-yang. For a harmonious experience, balancing opposing qualities, like quiet and busy areas of a room, darkness and light, or the angled and rounded shapes, is ideal. (Moran et al. 2005, 133; Jafari 2024, 53-54.)

The presence of the “Dragon Sand” formation is another way to foster a feeling of safety in the player. While the design should emphasize natural over constructed elements (Bramble 2003, 73), it is important to note that in urban settings buildings, walls, and large furniture can be used to represent mountains while roads can represent water (Moran et al. 2005, 46). Consequently, avoiding the “Dragon Sand” formation and emphasizing constructed elements could contribute to the experience of discomfort, vulnerability and danger.

In feng shui, large structures with well-defined, undamaged, and easily categorized shapes are considered positive (Bramble 2003, 73), contributing to a comfortable atmosphere. Confusing and deteriorating shapes on the other hand tend to create discomfort. Bramble (2003, 135) suggests that a space safe enough for toddlers and the elderly are likely to possess good feng shui and offer

a comfortable experience, whereas environments unsafe to these groups tend to create stress.

In addition to structural forms, general safety indicators and wuxing, feng shui principles offer other ways to manage the desired atmosphere. To foster a sense of safety, the player should ideally be able to see anyone entering the space. Additionally, having the player's back protected by a wall of similar solid structure, similar to the "Dragon Sand" formation, further contributes to feelings of security. (Moran et al. 2005, 132.) Conversely, placing a doorway behind the player, preventing them from seeing who enters, is an effective way to create stress and tension, already commonly used in horror games.

3.2 Guiding pathfinding by maintaining Spatial Flow

In feng shui, a space where the main entrance aligns with an exist or window leads to qi escaping without circulating (Xu 2022, 200). In level design, such layout, while easy to navigate, often discourages exploration, possibly preventing players from discovering intended content or areas. Irregular, dynamic lines, similar to those found in nature, tend to make designed environments feel more alive. Regimented, geometric shapes, on the other hand, often feel constructed and unnatural. (Jafari 2024, 48.) This principle applies equally to the design of individual objects, larger structures, and pathways. Guiding the player along a winding path through a space, following the way positive qi circulates, encourages exploration.

Paths additionally serve to divide space (Jafari 2024, 48) whether explicitly visible or subtly indicated through environmental cues like lighting, color, or strategic placement of objects (FXMedia Team 2023). Openings within a space, considered beneficial in feng shui (Xu 2022, 200; Jafari 2024, 48), can be effectively integrated alongside paths to enhance level design. Such openings can be utilized to offer views of landmarks to aid navigation, preview upcoming areas allowing players to plan areas, or show previously visited zones, fostering a sense of achievement (Saaristo 2020 13-17). These openings can also be used to deliver narrative clues, enticing further exploration (Totten 2014, xxiv).

Moreover, offering deliberately limited views along paths can be utilized to deliberately slow the player, or heighten their curiosity about concealed areas.

3.3 Harmonizing with Nature to create Comfort and Discomfort

Natural environments evoke feelings of comfort, while overly constructed spaces can cause discomfort and even negative social outcomes. Consequently, Bramble (2003, 120-122) notes that people tend to prefer natural environments, particularly those featuring water. Furthermore, people have a biological expectation for certain elements to appear in natural colors, reinforced by the fact natural colors are more memorable (Bramble 2003, 120-122).

The effects of ignoring these instinctual preferences are visible in urban design. Bramble (2003, 128) describes modernistic, minimalistic high-rise environments, with features like long straight streets designed for speeding, lack of privacy, and minimal landscaping, as contributing to high crime rates, social isolation, and deteriorated neighbor relations. These insights are useful when deliberately aiming to create an uncomfortable atmosphere in a game level.

Wuxing is the feng shui principle that can be used to adjust the atmosphere of a level by arranging objects and elements to maintain the flow of positive qi (Jafari 2024, 46). Achieving this involves balancing various qualities associated with the different wuxing phases, including shapes, colors and materials (Appendix 1). Care should be taken to ensure the phases are not mixed inappropriately, as this may produce unintended results. Additionally, balancing soft, vague shapes and precise, defined ones in a proportion that reflects the dynamic interplay of yin and yang (Appendix 2) is essential for controlling how natural or constructed a space feels (Bramble 2003, 117).

4 MODIFYING THE LEVEL

4.1 Analysis of the Original Level

This chapter analyzes the original design and spatial layout of the *Whacking Woodfellas* game level before the application of feng shui principles. The goal is to identify its inherent strengths and weaknesses, providing a foundation for subsequent modifications. Specifically, the analysis highlights areas where feng shui can be leveraged to enhance player experience.

The level under analysis functions as a combined hub and battle area within a first-person shooter (FPS) game designed for virtual reality (VR). Designed with people new to the medium in mind, a core design principle was balancing engagement through tension with accessibility for novices, aiming to minimize stress and cultivate interest in VR. Achieving atmospheric immersion was a central consideration in the design decisions. The setting of the level is an Art Deco entertainment center featuring a movie theatre as its central space (Figure 4). To reinforce immersion, the game menus are presented as physical buttons within the game world, and the environment contains additional interactable objects like a coffee cup and openable drawers.

Figure 4. Player Point of View

The level features static defense gameplay where the player operates within a fixed 2m x 3m space. The primary objective is to defeat incoming enemies while surviving their attacks, primarily by avoiding incoming ranged fire. The player is positioned at the projectionist desk which offers cover at the rear of the theatre.

Enemies approach in waves from the direction of the movie screen. Two enemy types exist: melee units that advance on the player for close-quarters engagement without shooting, and ranged units that patrol limited paths while firing from distance. Therefore, the key areas of the level are the designated position of the player, and the areas occupied or traversed by enemies (Figure 5).

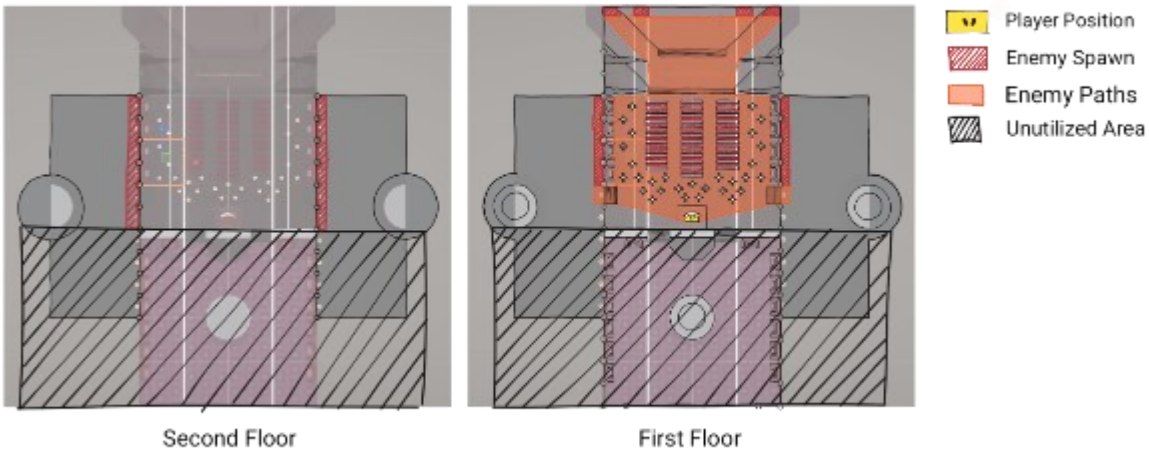

Figure 5. Top-Down construction of the level

Although the level design facilitates clear tracking of essential elements like enemies and the user interface, it incorporates significant unutilized space behind the designated position of the player. While contributing to architectural realism, this unused rear area hinders player orientation and fosters insecurity due to implied possibility of attacks from behind. Although the resulting tension might engage experienced players, it is potentially counterproductive for the target audience of VR novices. Additionally, while the movie screen serves as a strong focal point, the displayed movie content risks diverting attention from gameplay. Finally, the symmetrical layout of the level could contribute to visual monotony.

An analysis based on wuxing principles reveals a dominance of the wood element, represented both by abundant wood materials and the use of purple hues. The fire element is also prominent, manifested though red colors and lighting sources. Water is present in the black marble features, while metal

element appears in the railings, metallic detailing of objects and rounded shapes. Notably, the earth element is absent. This elemental imbalance is exacerbated by the predominance of wood, which follows the destructive cycle in relation to earth.

In terms of yin-yang, the level displays a degree of balance largely due to a spatial layout alternating dense arrangements with open spaces horizontally. However, certain layout choices present feng shui challenges. The open spaces between the movie theatre seating (Figure 5) permit overly linear enemy movement patterns. Furthermore, while the placement of tables contributes positively by introducing curvature to enemy paths, their quantity results in excessive clutter.

4.2 Implementing Feng Shui

The structure of the level consists of three conjoined rectangles, which is a shape considered conductive to stable and smooth qi circulation. However, based on the preceding analysis, several spatial modifications informed by feng shui principles can be utilized to enhance qi flow and gameplay. Firstly, reducing the number of tables and strategically introducing smaller-scale obstacles into the currently open, linear areas, promotes irregular less predictable enemy pathing, while maintaining the balance of clutter. This change aims to improve qi circulation by discouraging excessively linear movement patterns while largely preserving the established visual rhythm of alternating density and openness. Secondly, adding appropriate object placement to the stage area could further enhance balance and pathing complexity. Finally, relocating the side staircases forward towards the movie screen would create a clearer, less obstructed zone immediately before the player. (Figure 6.)

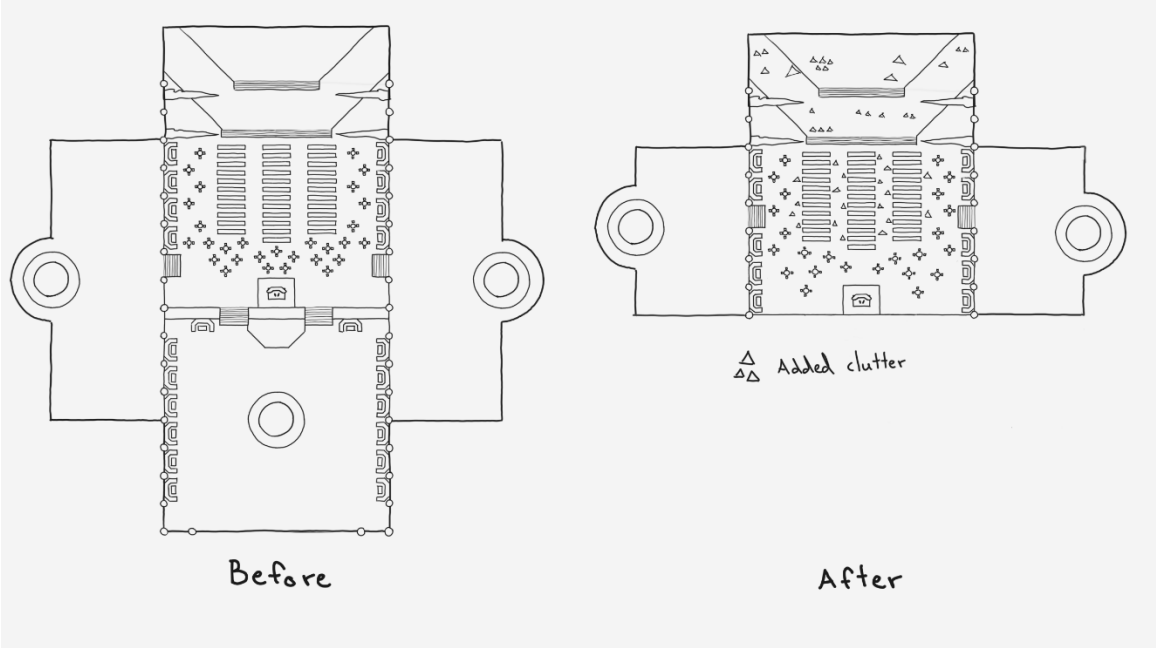

Figure 6. Top-down view of the level before and after modifications

Regarding wuxing, while introducing earth tones by replacing some of the purple would traditionally be suggested to balance the dominant wood element, this modification might be counterproductive to the desired gameplay feel. The current elemental state, strong Wood partially checked by Fire, is not necessarily detrimental and could instead contribute positively to gameplay. Specifically, the pronounced Wood element, associated with qualities like excessive ambition and confidence, potentially fosters a more challenging and engaging player experience by encouraging bolder, perhaps even careless, actions. Therefore, maintaining the existing Wood dominance, despite the formal imbalance according to wuxing cycles, could be considered a deliberate design choice to enhance gameplay intensity. Adding Earth is not recommended as it would weaken Fire and dilute the intended effect of the Wood element.

5 DISCUSSION

This chapter reflects the findings derived from the analysis and modification of the *Whacking Woodfellas* VR game level. The central aim of this thesis was to explore how feng shui, an ancient practice traditionally applied to physical architecture, could be meaningfully utilized for virtual spaces, specifically in the

context of VR FPS level design, to support and enhance the player experience.

5.1 Interpreting the Application of Feng Shui

One of the clearest insights gained from this study is that feng shui can be adapted to virtual environments in a way that aligns with existing level design practices. This is especially relevant in VR, where the player's sense of spatial presence and immersion has a heightened importance. The analysis in Chapter 4.1 showed that feng shui offers a novel terminology and perspective for identifying issues that might be overlooked in conventional level design. For example, identifying imbalance in wuxing offered a deeper layer of evaluating the atmosphere of the space. Similarly, the discovery that the large, unutilized area behind the player generated a sense of insecurity drew directly from feng shui's focus on sightlines and supporting the rear (Moran et al. 2005, 132), rather than traditional game design.

Moreover, the modifications suggested in Chapter 4.2 illustrate how abstract feng shui ideas such as qi circulation or ying-yang dynamics can be translated into actionable design strategies. The reconfiguration of enemy pathing to avoid excessive linearity reflects the feng shui principle that curved paths support the flow of positive qi better than direct ones (Xu 2022, 200). This example demonstrates that feng shui is not only compatible with conventional game design goals, like guiding the player attention, clarity of navigation, or encouraging exploration, but can actively enhance them.

Perhaps the most interesting outcome emerged from the wuxing analysis. The conventional feng shui practice is to maintain balance between the five phases. However, this study explored an alternative approach. The identified Wood and Fire dominance was preserved in order to support gameplay goals. These phases are associated with boldness, action and concentration (Jafari 2024, 47), qualities which align with the desired tone of a fast-paced VR defense game. The conscious decision to maintain imbalance demonstrates how feng shui principles can also be reinterpreted to serve the design goals. Rather than solely aiming for harmony like the traditional approach of feng shui, wuxing can be utilized to

intentionally create tension, unease, or other emotional states. This flexible interpretation aligns with Jafari's (2024, 46) view that spatial arrangements should be used to direct the desired energy within a space, which in games may not always be comfortable or harmonious.

The findings of this study suggest that feng shui can be a valuable addition to the level designer's toolkit, especially for VR where spatial flow has a direct impact on player's comfort. Concepts like "Dragon Sand" formation and the careful management of entrances and flow are highly relevant in VR environments, where player is more susceptible to discomfort and disorientation induced by poorly organized space.

The use of wuxing in this study also highlights how elements like color, material and shape, usually chosen for aesthetic or thematic reasons, can be reinterpreted as contributors to gameplay dynamics and emotional tone. When these elements are not thought of only in terms of visual appeal, but as expressions of different qualities, they function as another tool to control the gameplay experience.

However, as a single case study focused on one specific level in one genre of game, the generalizability of the findings cannot be verified. The application of feng shui principles also involves a degree of interpretation. While this study used existing literature as basis, adapting concepts like qi, wuxing, or yin-yang into concrete level design decisions requires subjective judgement. Different designers might have different interpretations, and therefore, make different decisions. Additionally, this study focused on a selection of feng shui concepts. Exploring further principles, like the Bagua map, might yield further insights.

Most importantly, the design modifications proposed in Chapter 4.2 remain at a theoretical level. Without empirical playtesting, the improvements to player experience are speculative. This is a key limitation, given that user perception is central to both feng shui and level design.

5.2 Suggestions for Future Research

There are several avenues for further research:

1. Empirical Testing: A logical next step would be to implement the proposed modifications and perform AB testing with players, comparing gameplay experience, emotional response, and a sense of spatial comfort before and after implementation.
2. Broader Application: Exploring the use of feng shui principles in pacing of enemy waves and the spawn patterns within waves would bring interesting insights on their applicability to another aspect of level design.
3. Expanded Feng Shui integration: Including additional feng shui principles like the Bagua map and the qualities associated with cardinal directions might lead to interesting spatial strategies in games where the player movement is not as heavily restricted.
4. Cross-Cultural Studies: Since feng shui originates from Chinese traditions, it would be valuable to explore whether players from different cultural backgrounds respond differently to feng shui-informed level design.

.

6 CONCLUSION

This thesis explored the application of feng shui as both an analytical tool and design framework for virtual reality level design. Through the case study of *Whacking Woodfellas*, a stationary defense VR FPS level, the study demonstrated how feng shui concepts like qi flow, wuxing and yin-yang, can be translated into actionable insights for evaluating and improving player experience.

Analyzing the original level revealed unbalanced wuxing, spatial arrangement enabling overly linear enemy pathing, and architectural features that potentially disrupt player comfort and orientation. In response, a set of modifications was proposed to promote smoother qi circulation, increase navigational clarity, and better support desired gameplay atmosphere.

A particularly significant finding was the importance of contextual interpretation. While feng shui traditionally seeks balance and harmony, game design often thrives on tension, challenge, or emotional contrast. This became clear in the decision to maintain the dominance of Wood qi, despite its imbalance in traditional terms, in order to foster player ambition. This underscores the value of

adaptive application, where feng shui principles are used to inform, rather than dictate, design decisions.

While the case study approach offers concrete application, it is limited in the generalizability of the findings. The absence of empirical testing also means the proposed benefits are purely theoretical. Nevertheless, the thesis suggests that feng shui offers a useful and novel tool for designers working in immersive media. Beyond aesthetics, it provides a framework for considering how space influences player emotion, behavior, and perception, dimensions with heightened importance in VR.

In conclusion, feng shui can serve as a complementary methodology in level design. It excels as a tool for creating virtual spaces that feel intuitively coherent, atmospherically resonant, and psychologically engaging. Future research, especially involving player studies and deeper exploration of feng shui principles, could further clarify and expand the role of this ancient system of spatial organization in shaping modern digital experiences.

REFERENCES

Azarby, S., Rice, A. 2022. Understanding the Effects of Virtual Reality System Usage on Spatial Perception: The Potential Impacts of Immersive Virtual Reality on Spatial Design Decisions. *Sustainability 2022*, 14 (16), 10326. Available at: https://doi.org/10.3390/su141610326 [Accessed 22 September 2024]

Bramble, C. 2003. Architect's guide to Feng Shui: exploding the myth. Oxford, Burlington: Architectural Press.

Dealessandri, M. 2020. The best practices and design principles of VR development. Web page. Available at: https://www.gamesindustry.biz/the-best-practices-and-design-principles-of-vr-development. [Accessed 7 October 2024].

FXMedia Team. 2023. VR Game Design Principles for Immersive and Enjoyable Experiences. Web page. Available at: https://fxmweb.com/insights/vr-game-design-principles-for-immersive-and-enjoyable-experiences.html [Accessed 6 October 2024].

FXMedia Team. 2024. VR Trends in 2024: A Comprehensive Outlook. Web page. Available at: https://fxmweb.com/insights/vr-trends-in-2024-a-comprehensive-outlook.html [Accessed 6 October 2024].

Heim, M. n.d. The Feng Shui of VR. *Crossings: eJournal of Art and Technology,* 1(1). E-journal. Available at: https://crossings.tcd.ie/issues/1.1/Heim/ [Accessed 22 September 2024].

Hui, C. 2018. Applied research on environmental psychology in architecture environment design. University of Pécs. Engineering and Information Technology. Dissertation for the degree of Doctor of Liberal Arts (DLA) in Architecture. PDF document. Available at: https://pea.lib.pte.hu/handle/pea/34282 [Accessed 22 September 2024]

Jafari, H. 2024. Application of Taoist Principles and Feng Shui in Urban Spaces (Landscaping and Garden Design). *Journal of Interdisciplinary Studies in Society, Law and Politics*, 2(3), 90-100. E-journal. Available at: https://journalisslp.com/index.php/isslp/article/view/72 [Accessed 22 September 2024]

Jin, Z. & Juan, Y.K. 2021. Is Fengshui a science or superstition? A new approach combining the physiological and psychological measurement of indoor environments. *Building and Environment* 201, 107992. Available at: https://doi.org/10.1016/j.buildenv.2021.107992 [Accessed 22 September 2024]

Kokke, T. 2023. VR Game Design Principles. Web page. Available at: https://timmykokke.com/blog/2023/2023-05-30-vr-game-design-principles/ [Accessed 6 October 2024].

Kramer, N. 2024. VR Interaction Design: Best Practices & Principles. Web page. Available at: https://daily.dev/blog/vr-interaction-design-best-practices-and-principles [Accessed 6 October 2024].

Kryžanowski, Š. 2021. Feng Shui: A Comprehensive Review of its Effectiveness Based on Evaluation Studies. *International Journal of Advances in Scientific Research and Engineering,* 7(11), 61–71. E-journal. Available at: https://doi.org/10.31695/IJASRE.2021.34103 [Accessed 22 September 2024]

Lahman, A. 2024. Biophilic Design and Its Effects on Mental and Physical Health. Western Kentucky University. Mahurin Honors College. PDF. Available at: https://digitalcommons.wku.edu/stu_hon_theses/1031/ [Accessed 22 September 2024]

Li, G. & Ratthai, P. 2024. Combining Contemporary Design Principles with the Craftsmanship of Ancient Chinese Architecture. Frontiers in Artificial Intelligence and Applications. Beijing: IOS Press. Available at: https://doi.org/10.3233/FAIA231498 [Accessed 22 September 2024]

Lin, Z., Yang, Z. & Ye, X. 2023. Immersive Experience and Climate Change Monitoring in Digital Landscapes: Evidence from Somatosensory Sense and Comfort. *International Journal of Environmental Research and Public Health*, 20(4), 3332. PDF. Available at: https://doi.org/10.3390/ijerph20043332 [Accessed 22 September 2024]

Ma, Y.C., Kim, S. & Kim, S-K. 2020. Research on the Verification of Game Development by Emotional Interaction Design. *International Journal of Engineering Research and Technology*,13(5), 916-922. Available at: https://doi.org/10.37624/IJERT/13.5.2020 [Accessed 22 September 2024]

Mak, M.Y. & Ng, S.T. 2005. The art and science of Feng Shui—a study on architects' perception. *Building and Environment,* 40(3), 427–434. PDF. Available at: https://doi.org/10.1016/j.buildenv.2004.07.016 [Accessed 22 September 2024]

Mollazadeh, M. & Zhu, Y. 2021. Application of Virtual Environments for Biophilic Design: A Critical Review. *Buildings*, 11(4), 148. Available at: https://doi.org/10.3390/buildings11040148 [Accessed 22 September 2024]

Moran, E., Yu, J. & Biktashev, V. 2005. The Complete Idiot's Guide to Feng Shui. 3rd Edition. New York: Penguin Random House LLC.

Mostajeran, F., Steinicke, F., Reinhart, S., Stuerzlinger, W., Riecke, B.E.& Kühn, S. 2023. Adding virtual plants leads to higher cognitive performance and psychological well-being in virtual reality. *Scientific Reports*, 13, 8053. PDF. Available at: https://doi.org/10.1038/s41598-023-34718-3 [Accessed 22 September 2024]

Pham, T.P. & Sanocki, T. 2024. Human Attention Restoration, Flow, and Creativity: A Conceptual Integration. *Journal of Imaging*, 10(4), 83. PDF. Available at: https://doi.org/10.3390/jimaging10040083 [Accessed 22 September 2024]

Saaristo, V. 2020. Level Design in Virtual Reality. Tampere University of Applied Sciences. Business Information Systems. PDF. Available at: https://urn.fi/URN:NBN:fi:amk-2020111923351 [Accessed 22 September 2024]

Schell, J. 2020. The art of game design: a book of lenses. 3rd edition. Boca Raton: CRC Press/Taylor & Francis Group.

Shemesh, A., Leisman, G., Bar, M. & Grobman, Y.J. 2022. The emotional influence of different geometries in virtual spaces: A neurocognitive examination. *Journal of Environmental Psychology*, 81, 101802. PDF. Available at: https://doi.org/10.1016/j.jenvp.2022.101802 [Accessed 22 September 2024]

Totten, C.W. 2014. An Architectural Approach to Level Design. Boca Raton: CRC Press/Taylor & Francis Group.

Totten, C.W. 2021. The Spirit of Digital Place: Architectural Dwelling and Game Space. Conference presentation. 3 September.

VR Design Principles. n.d. ViroReact. Web page. Available at: https://viro-community.readme.io/docs/vr-design-principles [Accessed 7 October 2024].

Wen, L. T. 2024. 4 VR Tech Trends to Watch in 2024. Web page. Available at: https://blog.vive.com/us/4-vr-tech-trends-to-watch-in-2024/ [Accessed 7 October 2024].

Xu, P. 2022. Healthy Living in the Built Environment in Light of Feng-shui. *International Journal of e-Healthcare Information Systems*, 8(1), 196–202. PDF. Available at: https://doi.org/10.20533/ijehis.2046.3332.2022.0028 [Accessed 22 September 2024]

Zhang, Y. 2018. Research on the Application of the Chinese Traditional Culture on Product Design. *Proceedings of the 6th International Conference on Social Science, Education and Humanities Research (SSEHR 2017).* PDF. Available at: https://doi.org/10.2991/ssehr-17.2018.17 [Accessed 22 September 2024]

Zhao, Z., Zhang, S. & Peng, Y. 2023. Analysis of Winter Environment Based on CFD Simulation: A Case Study of Long–Hu Sand Feng Shui Layout at Jiangxi Bailudong Academy Complex. *Buildings*, 13(4), 1101. PDF. Available at: https://doi.org/10.3390/buildings13041101 [Accessed 22 September 2024]

LIST OF FIGURES

QUALITIES ASSOCIATED WITH THE PHASES OF WUXING

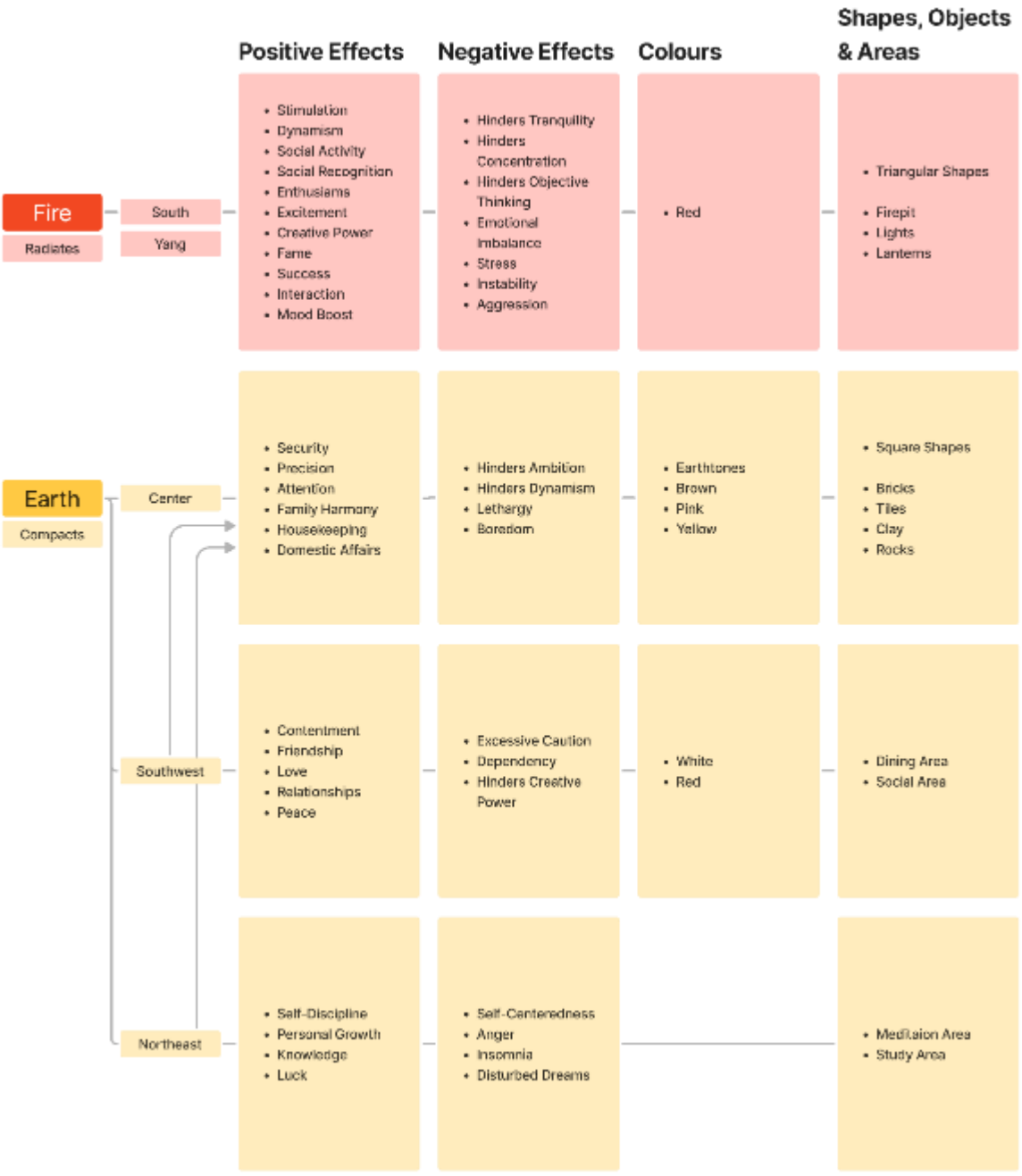

Figure 7. Examples of qualities associated with Fire and Earth according to wuxing

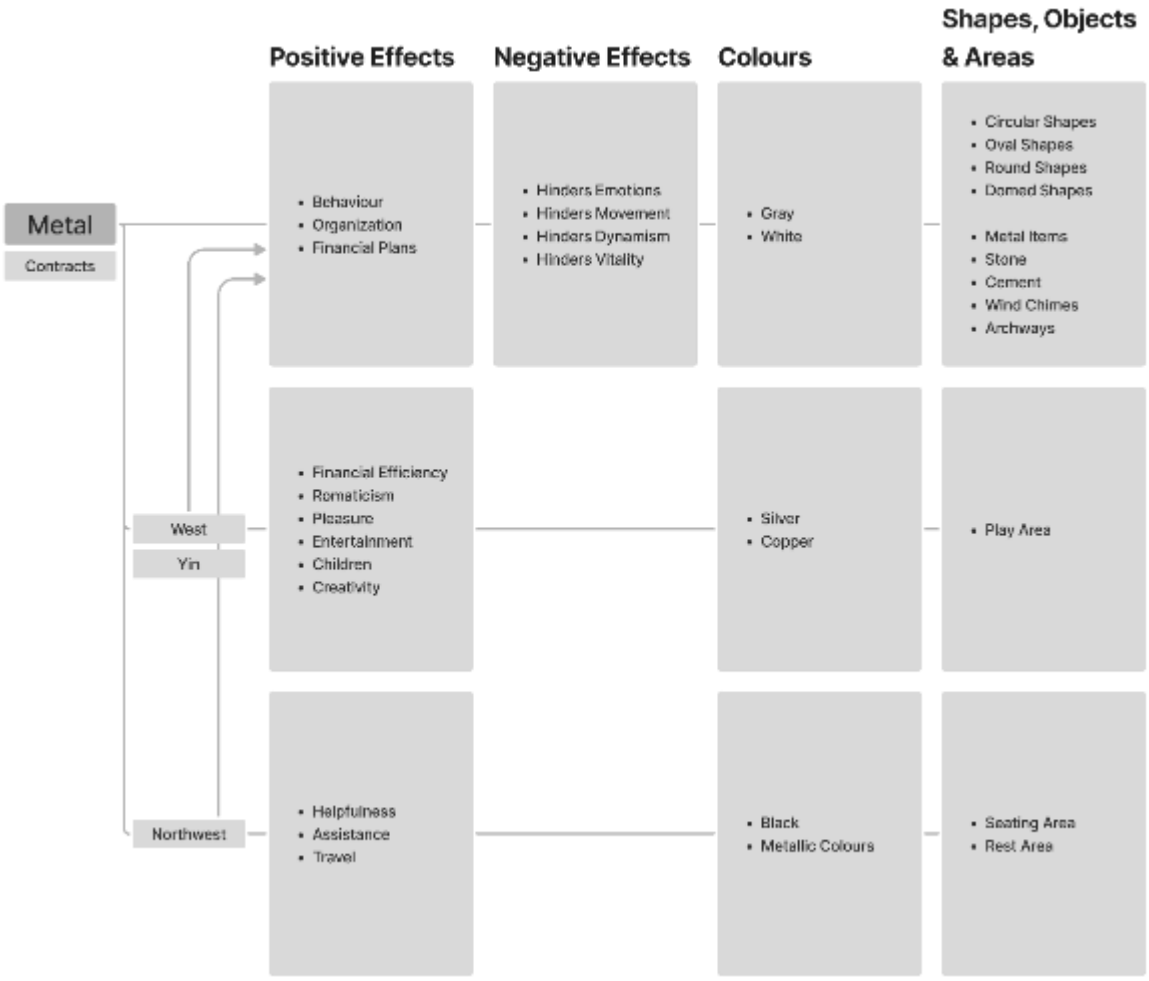

Figure 8. Examples of qualities associated with Metal according to wuxing

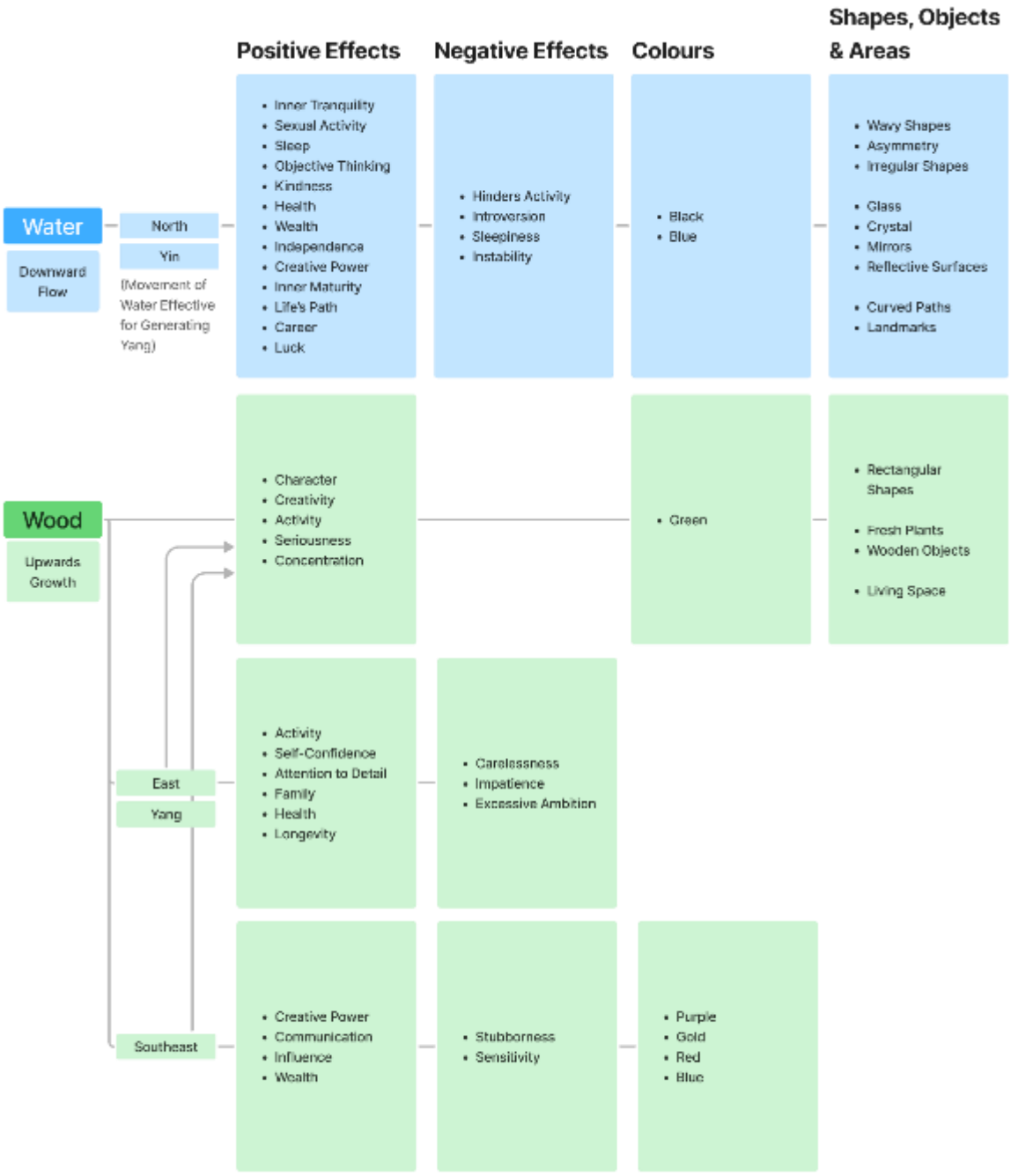

Figure 9. Examples of qualities associated with Water and Wood according to wuxing

QUALITIES OF YIN AND YANG

Yin	Yang
• Passive • Dark • Cold • Wet • Mountains	• Active • Light • Heat • Dry • Ocean
• Condenses • Descents	• Expands • Rises
• Matter	• Pure Energy
• Quiet, calm areas with no entrances or openings	• Active areas with entrances and openings
• Clutter	• Empty
• South • East	• North • West

Figure 10. Qualities of yin and yang