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RAHUL KUMAR (BMCOMM1907)



INTRODUCTION

For centuries geometry was effectively Euclidean Geometry: it was thought to be the one real geometry, representing space in a realistic way and, thus, no other geometry was believed possible.

When global navigation began, the natural, roughly spherical geometry of the earth's surface was revealed (Stewart, 2016). On a sphere, geodesics will necessarily meet: in this geometry parallel lines are absent.

However, hyperbolic geometry was developed (in the 19th century) before elliptic geometry, and in the former there are infinite lines parallel to a given line at a given point. Today there are a variety of non-Euclidean geometries, corresponding to curved surfaces. The general theory of relativity demonstrated that in the vicinity of bodies of great mass such as stars, space-time is not flat but, rather, curved. There is another type of geometry, called projective geometry, the development of which was based the perspective techniques used by painters and architects. If we are on a Euclidean plane between two parallel lines, we see that these meet on the horizon: the horizon is not part of the plane but is a "line at infinity".



Geometry, Shapez in Architecture:

Architecture could be said to begin with geometry. Since earliest times, builders relied on imitating natural forms like the circular Stonehenge in Britain and then applied mathematical principles to standardize and replicate the forms.

The Beginnings

The Greek mathematician Euclid of Alexandria is considered the first to write down all the rules related to geometry in 300 BCE. Later, in about 20 BCE, the ancient Roman architect Marcus Vitruvius penned more rules in his De Architectura, or Ten Books on Architecture. Vitruvius is responsible for all the geometry in today's built environment—at least he was the first to write down the proportions for how structures should be constructed.

Renaizzance Popularity

It wasn't until centuries later, during the Renaissance, that interest in Vitruvius became popular. Cesare Cesariano (1475-1543) is considered the first architect to translate Vitruvius' work from Latin into Italian in about 1520 CE. Decades earlier, however, the Italian Renaissance artist and architect Leonardo da Vinci (1452-1519) sketched out the "Vitruvian Man" in his notebook, making da Vinci's the iconic image imprinted onto our consciousness.

The images of the Vitruvian Man are inspired by the works and writings of Vitruvius. The "man" portrayed represents the human being. The circles, squares, and ellipses that surround the figures are Vitruvian calculations of man's physical geometry. Vitruvius was the first to write his observations about the human body—that the symmetry of two eyes, two arms, two legs, and two breasts must be an inspiration of the gods.



Models of Proportion and Symmetry

Vitruvius believed that builders should always use precise ratios when constructing temples. "For without symmetry and proportion no temple can have a regular plan," Vitruvius wrote.

The symmetry and proportion in design that Vitruvius recommended in De Architectura were modeled after the human body. Vitruvius observed that all human beings are shaped according to a ratio that is astonishingly precise and uniform. For example, Vitruvius found that the human face equals one-tenth of the total body height. The foot equals one-sixth of the total body height. And so on.

Scientists and philosophers later discovered that the same ratio Vitruvius saw in the human body—1 to phi (Φ) or 1.618—exists in every part of nature, from swimming fish to swirling planets. Sometimes called a "golden ratio" or "divine ratio," the Vitruvian "divine proportion" has been called the building block of all life and the hidden code in architecture.

Architecture of Antilia

Antilia was built in consultation with US architecture firms Perkins and Will & Hirsch Bedner Associates, with the Australian-based construction company Leighton Contractors initially taking charge of its construction. The construction was completed by B.E.Billimoria & Company Ltd. The home has 27 floors with extra-high ceilings. (Other buildings of equivalent height may have as many as 60 floors.) The home was also designed to survive an earthquake rated 8 on the Richter scale. It is considered by some to be the tallest single-family house in the world, but others disqualify the Antilia because it includes space for a staff of 600.









Architecture of Taj Hotel:

The Taj Mahal Palace Hotel, is a heritage, five-star, luxury hotel built in the Saracenic Revival style in the Colaba region of Mumbai, Maharashtra, India, situated next to the Gateway of India. Historically it was known as the "Taj Mahal Hotel" or simply "the Taj". It was one of the main sites targeted in the 2008 Mumbai attacks

The Taj Mahal Palace was originally designed by Indian architects DN Mirza and Sitaram Khanderao Vaidya. The project was completed by the British architect and engineer WA Chambers. The sea-facing hotel structure is built on a 40ft-deep foundation





Geometry in Our Environment

"Sacred geometry," or "spiritual geometry," is the belief that numbers and patterns such as the divine ratio have sacred significance. Many mystical and spiritual practices begin with a fundamental belief in sacred geometry. Architects and designers may draw upon concepts of sacred geometry when they choose particular geometric forms to create pleasing, soul-satisfying spaces.

The following examples of geometry in the environment frequently influence architectural design :

- The body
- Gardens
- Stones
- The sea
- The Heavens
- Music
- The cosmic grid





The Body

When studied under the microscope, living cells reveal a highly ordered system of shapes and patterns. From the double helix shape of your DNA to the cornea of your eye, every part of your body follows the same predictable patterns.

Gardenz

The jigsaw puzzle of life is made up of recurring shapes and numbers. Leaves, flowers, seeds, and other living things share the same spiral shapes. Pine cones and pineapples, in particular, are composed of mathematical spirals. Honeybees and other insects live structured lives that mimic these patterns. When we create a floral arrangement or walk through a labyrinth we celebrate nature's innate forms.

Stonez

Nature's archetypes are reflected in the crystalline forms of gems and stones. Amazingly, the patterns found in your diamond engagement ring may resemble the formation of snowflakes and the shape of your own cells. The practice of stacking stones is a primitive, spiritual activity.

The Sea

Similar shapes and numbers are found beneath the sea, from the swirl of a nautilus shell to the movement of the tides. Surface waves themselves are patterned, like waves that pulse through air. Waves have mathematical properties all their own.



The Heavens

Nature's patterns are echoed in the movement of planets and stars and the cycles of the moon. Perhaps this is why astrology lies at the heart of so many spiritual beliefs.

Muzic

The vibrations we call sound follow sacred, archetypal patterns. For this reason, you may find that certain sound sequences can stimulate the intellect, inspire creativity, and evoke a deep sense of joy.

The Cozmic Grid

Stonehenge, megalithic tombs, and other ancient sites stretch across the globe along underground electromagnetic tracks or ley lines. The energy grid formed by these lines suggests sacred shapes and ratios.

Theology

Best-selling author Dan Brown has made a lot of money by using the concepts of sacred geometry to weave a spell-binding tale about conspiracy and early Christianity. Brown's books are pure fiction and have been hotly criticized. But even when we dismiss The Da Vinci Code as a tall tale, we can't dismiss the importance of numbers and symbols in religious faith. Concepts of sacred geometry are expressed in the beliefs of Christians, Jews, Hindus, Muslims, and other formal religions.





GEOMETRY AND ARCHITECTURE

From the pyramids in Egypt to the new World Trade Center tower in New York City, great architecture uses the same essential building blocks as your body and all living things. In addition, the principles of geometry are not confined to great temples and monuments. Geometry shapes all buildings, no matter how humble. Believers say that when we recognize geometric principles and build upon them, we create dwellings that comfort and inspire. Perhaps this is the idea behind the architect's conscious use of divine proportion like Le Corbusier did for the United Nations building.







HOW NATURE INFLUENCES ARCHITECTURE:

Nature is often an influencer in the world of architecture. Known as biomimicry, humankind has studied nature for inspiration in solving all kinds of problems, not just architectural or building. Leonardo da Vinci studied birds in his quest to create a flying machine that eventually inspired the Wright Brothers. The following are some wonderful examples of how observing function in the natural world has led to advances in architectural products.

Poorly conceived design divides us in urban areas from our wilds and has contributed to seeing nature as something isolated from us. Yet reinvigorating our bond with nature is a challenge architecture and urban design are well placed to address.

Architects and designers have control over our built environment; by changing the way we design cities and buildings to connect to rather than disconnect from nature, we can change our proximity to nature and shift our physical relationship to the environment.



WHAT IS SHAPE IN ARCHITECTURE?

Shape is a two dimesional area confined by a actual line or implied line (an edge for example). In drawing shapes are created when the ends of lines are joined to enclose areas

The simplest way to define architecture is the design of buildings or the creation of spaces that express ideas. In the ancient world, architecture was symbolic and dimensions and sun orientation were critically important. When the Greek temple arrived, it combined beauty and functionality. The Parthenon of Athens was designed by architects Callicrates and Ictinus and not by priests. Their legacy includes the geometrical shapes comprising the Parthenon, particularly the rectangle and the triangle







MATHEMATICS & ARCHITECTURE

Mathematics and architecture are related, since, as with other arts, architects use mathematics for several reasons. Apart from the mathematics needed when engineering buildings, architects use geometry: to define the spatial form of a building; from the Pythagoreans of the sixth century BC onwards, to create forms considered harmonious, and thus to lay out buildings and their surroundings according to mathematical, aesthetic and sometimes religious principles; to decorate buildings with mathematical objects such as tessellations; and to meet environmental goals, such as to minimise wind speeds around the bases of tall buildings.

CONTINUATION...

In ancient Egypt, ancient Greece, India, and the Islamic world, buildings including pyramids, temples, mosques, palaces and mausoleums were laid out with specific proportions for religious reasons. In Islamic architecture, geometric shapes and geometric tiling patterns are used to decorate buildings, both inside and outside. Some Hindu temples have a fractal-like structure where parts resemble the whole, conveying a message about the infinite in Hindu cosmology. In Chinese architecture, the tulou of Fujian province are circular, communal defensive structures. In the twentyfirst century, mathematical ornamentation is again being used to cover public buildings.







ARCHITECTURE & ITS BASES

The earliest surviving written work on the subject of architecture is De architectura by the Roman architect Vitruvius in the early 1st century AD. According to Vitruvius, a good building should satisfy the three principles of firmitas, utilitas, venustas, commonly known by the original translation – firmness, commodity and delight. An equivalent in modern English would be:

Durability – a building should stand up robustly and remain in good condition.

Utility – it should be suitable for the purposes for which it is used.

Beauty – it should be aesthetically pleasing.









ARCHITECTURE IN THE 19TH CENTURY

The notable 19th-century architect of skyscrapers, Louis Sullivan, promoted an overriding precept to architectural design: "Form follows function".

While the notion that structural and aesthetic considerations should be entirely subject to functionality was met with both popularity and skepticism, it had the effect of introducing the concept of "function" in place of Vitruvius' "utility". "Function" came to be seen as encompassing all criteria of the use, perception and enjoyment of a building, not only practical but also aesthetic, psychological and cultural.

Nunzia Rondanini stated, "Through its aesthetic dimension architecture goes beyond the functional aspects that it has in common with other human sciences. Through its own particular way of expressing values, architecture can stimulate and influence social life without presuming that, in and of itself, it will promote social development."

To restrict the meaning of (architectural) formalism to art for art's sake is not only reactionary; it can also be a purposeless quest for perfection or originality which degrades form into a mere instrumentality".

Among the philosophies that have influenced modern architects and their approach to building design are Rationalism, Empiricism, Structuralism, Poststructuralism, Deconstruction and Phenomenology.

In the late 20th century a new concept was added to those included in the compass of both structure and function, the consideration of sustainability, hence sustainable architecture. To satisfy the contemporary ethos a building should be constructed in a manner which is environmentally friendly in terms of the production of its materials, its impact upon the natural and built environment of its surrounding area and the demands that it makes upon non-sustainable power sources for heating, cooling, water and waste management, and lighting.























PHILOSOPHY AND ARCHITECTURE

The philosophy of architecture is a branch of philosophy of art, dealing with aesthetic value of architecture, its semantics and relations with development of culture.

Plato to Michel Foucault, Gilles Deleuze, Robert Venturi as well as many other philosophers and theoreticians, distinguish architecture ('technion') from building ('demiorgos'), attributing the former to mental traits, and the latter to the divine or natural.

The Wittgenstein House is considered one of the most important examples of interactions between philosophy and architecture. Built by renowned Austrian philosopher Ludwig Wittgenstein, the house has been the subject of extensive research about the relationship between its stylistic features, Wittgenstein's personality, and his philosophy.





ANCIENT ARCHITECTURE

In many ancient civilizations such as those of Egypt and Mesopotamia, architecture and urbanism reflected the constant engagement with the divine and the supernatural, and many ancient cultures resorted to monumentality in architecture to represent symbolically the political power of the ruler, the ruling elite, or the state itself.

The architecture and urbanism of the Classical civilizations such as the Greek and the Roman evolved from civic ideals rather than religious or empirical ones and new building types emerged. Architectural "style" developed in the form of the Classical orders. Roman architecture was influenced by Greek architecture as they incorporated many Greek elements into their building practices.

Texts on architecture have been written since ancient time. These texts provided both general advice and specific formal prescriptions or canons. Some examples of canons are found in the writings of the 1st-century BCE Roman Architect Vitruvius. Some of the most important early examples of canonic architecture are religious.



MODERNISM

round the beginning of the 20th century, general dissatisfaction with the emphasis on revivalist architecture and elaborate decoration gave rise to many new lines of thought that served as precursors to Modern architecture. Notable among these is the Deutscher Werkbund, formed in 1907 to produce better quality machine-made objects. The rise of the profession of industrial design is usually placed here. Following this lead, the Bauhaus school, founded in Weimar, Germany in 1919, redefined the architectural bounds prior set throughout history, viewing the creation of a building as the ultimate synthesis—the apex—of art, craft, and technology.

When modern architecture was first practised, it was an avant-garde movement with moral, philosophical, and aesthetic underpinnings. Immediately after World War I, pioneering modernist architects sought to develop a completely new style appropriate for a new post-war social and economic order, focused on meeting the needs of the middle and working classes. They rejected the architectural practice of the academic refinement of historical styles which served the rapidly declining aristocratic order. The approach of the Modernist architects was to reduce buildings to pure forms, removing historical references and ornament in favor of functional details. Buildings displayed their functional and structural elements, exposing steel beams and concrete surfaces instead of hiding them behind decorative forms. Architects such as Frank Lloyd Wright developed organic architecture, in which the form was defined by its environment and purpose, with an aim to promote harmony between human habitation and the natural world with prime examples being Robie House and Fallingwater.

Architects such as Mies van der Rohe, Philip Johnson and Marcel Breuer worked to create beauty based on the inherent qualities of building materials and modern construction techniques, trading traditional historic forms for simplified geometric forms, celebrating the new means and methods made possible by the Industrial Revolution, including steel-frame construction, which gave birth to high-rise superstructures. Fazlur Rahman Khan's development of the tube structure was a technological break-through in building ever higher. By mid-century, Modernism had morphed into the International Style, an aesthetic epitomized in many ways by the Twin Towers of New York's World Trade Center designed by Minoru Yamasaki.



POSTMODERNISM

Many architects resisted modernism, finding it devoid of the decorative richness of historical styles. As the first generation of modernists began to die after World War II, the second generation of architects including Paul Rudolph, Marcel Breuer, and Eero Saarinen tried to expand the aesthetics of modernism with Brutalism, buildings with expressive sculptural façades made of unfinished concrete. But an even new younger postwar generation critiqued modernism and Brutalism for being too austere, standardized, monotone, and not taking into account the richness of human experience offered in historical buildings across time and in different places and cultures.

One such reaction to the cold aesthetic of modernism and Brutalism is the school of metaphoric architecture, which includes such things as biomorphism and zoomorphic architecture, both using nature as the primary source of inspiration and design. While it is considered by some to be merely an aspect of postmodernism, others consider it to be a school in its own right and a later development of expressionist architecture.

Beginning in the late 1950s and 1960s, architectural phenomenology emerged as an important movement in the early reaction against modernism, with architects like Charles Moore in the United States, Christian Norberg-Schulz in Norway, and Ernesto Nathan Rogers and Vittorio Gregotti, Michele Valori, Bruno Zevi in Italy, who collectively popularized an interest in a new contemporary architecture aimed at expanding human experience using historical buildings as models and precedents. Postmodernism produced a style that combined contemporary building technology and cheap materials, with the aesthetics of older pre-modern and non-modern styles, from high classical architecture to popular or vernacular regional building styles. Robert Venturi famously defined postmodern architecture as a "decorated shed" (an ordinary building which is functionally designed inside and embellished on the outside), and upheld it against modernist and brutalist "ducks" (buildings with unnecessarily expressive tectonic forms).









ARCHITECTURE TODAY

Since the 1980s, as the complexity of buildings began to increase (in terms of structural systems, services, energy and technologies), the field of architecture became multi-disciplinary with specializations for each project type, technological expertise or project delivery methods. Moreover, there has been an increased separation of the 'design' architect from the 'project' architect who ensures that the project meets the required standards and deals with matters of liability. The preparatory processes for the design of any large building have become increasingly complicated, and require preliminary studies of such matters as durability, sustainability, quality, money, and compliance with local laws. A large structure can no longer be the design of one person but must be the work of many. Modernism and Postmodernism have been criticised by some members of the architectural profession who feel that successful architecture is not a personal, philosophical, or aesthetic pursuit by individualists; rather it has to consider everyday needs of people and use technology to create liveable environments, with the design process being informed by studies of behavioral, environmental, and social sciences.

Environmental sustainability has become a mainstream issue, with a profound effect on the architectural profession. Many developers, those who support the financing of buildings, have become educated to encourage the facilitation of environmentally sustainable design, rather than solutions based primarily on immediate cost. Major examples of this can be found in passive solar building design, greener roof designs, biodegradable materials, and more attention to a structure's energy usage. This major shift in architecture has also changed architecture schools to focus more on the environment. There has been an acceleration in the number of buildings that seek to meet green building sustainable design principles. Sustainable practices that were at the core of vernacular architecture increasingly provide inspiration for environmentally and socially sustainable contemporary techniques. The U.S. Green Building Council's LEED (Leadership in Energy and Environmental Design) rating system has been instrumental in this.





NAVAL ARCHITECTURE

Naval architecture, also known as naval engineering, is an engineering discipline dealing with the engineering design process, shipbuilding, maintenance, and operation of marine vessels and structures. Naval architecture involves basic and applied research, design, development, design evaluation and calculations during all stages of the life of a marine vehicle. Preliminary design of the vessel, its detailed design, construction, trials, operation and maintenance, launching and dry-docking are the main activities involved. Ship design calculations are also required for ships being modified (by means of conversion, rebuilding, modernization, or repair). Naval architecture also involves the formulation of safety regulations and damage control rules and the approval and certification of ship designs to meet statutory and non-statutory requirements.



LANDSCAPE ARCHITECTURE

Landscape architecture is the design of outdoor public areas, landmarks, and structures to achieve environmental, social-behavioral, or aesthetic outcomes. It involves the systematic investigation of existing social, ecological, and soil conditions and processes in the landscape, and the design of interventions that will produce the desired outcome. The scope of the profession includes landscape design; site planning; stormwater management; environmental restoration; parks and recreation planning; visual resource management; green infrastructure planning and provision; and private estate and residence landscape master planning and design; all at varying scales of design, planning and management. A practitioner in the profession of landscape architecture is called a landscape architect.





WHAT HAVE I LEARNT FROM THIS COURSE

Lessons are from many adventures, experiences and subjects. There is a lot to learn in Photography than any other course. The first one is you get to learn about the camera. How it works and how to capture image. Then you get to learn about the core concepts of photography. You get to know how changing your aperture changes the look of your photo, how to set your shutter speed to get the results you want and you are able to make descisions with your ISO that fit your situation.

A good exposure is how bright you want the image to be. Also the different techniques, framing, rules of third, getting a crisp image Metering and Bracketing, Different shot mode, Different shot type, Slow shutter speed Exposure meter, Digital Photography Composition rules, Basic of digital color theory, Basic Color Wheel.

The Difference between Raw Vs JPEG and Photography Vs photo journalism. Also learnt about the different genres of Photography.

The core aspects of photography that every shooter should be studying and developing. Like Some of them can be understood in a short period of time, and others will take a lifetime to master. If you pay attention, you will find that you can learn life lessons from many adventures, encounters, and experiences. Some of the lessons learned from photography are some of the most meaningful and profound.

There is a lot to learn in photography and life in general. Patience and Perseverance is the key. Photography has taught me to be prepared for the worst, because you never know what will happen next. Making this book took me more than 3 months. Photography has taught me that you're not the best, there are thousands of people who are way better than you but everytime you capture an image you can create history that all depends upon your creativity and knowledege you have on photography. Photography has also taught me to focus and to make myself better.

Everytime you click you are better than before you constantly improve your skills.

The most important thing that photography has taught me is to be a good human and make connections to people and tell stories of the unknown.

Photography is an essential skill one should have, for a storyteller, or a journalist or any one. Because you just don't make memories with photographs you conect with people.