

## **An Artist's (or Writer or Musician's) Guide to Mathematics in Art**

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**Abstract:** *This paper discusses the significance of the combination of art/music and mathematics. The paper presents the viewpoint that the use of mathematical and scientifically derived logical structures can help implement objectives and messages and specific structure of thought in art and music.*

### **Introduction:**

Numbers (especially ones that uniquely possess logically simple algebraic properties that pertain exclusively to itself or are in a network of numbers with theoretical or expressive conjunctive logical properties), the structure and spectra of molecules and materials, mathematical functions and curvatures, natural forms and other things like this are all around us and are studied in various sciences in the process of classifying things and tie us down so that what would in one instance be abstract is now uniformly distributed, universal, symbolic and established as a common perception and intellectual commodity. The art, literature and music of abstraction as well as targeted impressionism shares the process of obtaining a structure that fits the aesthetic requirements or taste of the artist. There are plenty of methods to impress a common symbol or idea or message, and most rely on being specific about what is contained in the perspective of the artist or musician. Harmony and proportion are used on a general level to express significances and detail as they rise, fall, shrink and grow.

Numbers, proportion and context are the root of determining how, if something is depicted, how it is to be seen, proven by the fact that size, detail, caricature, facial emotion, simple spatial conformations and etc. are all specific due to logical constraints that are expressed mathematically in space. This is why, instead of focusing on the depiction of 'science,' which is an all-encompassing term to the mastery of classification and understanding, that the fine to coarse detail in the variance of things generated by numeric or combinatorial elements (numerically speciating or tinting or tuning or etc.) expressed between and/or within a depiction or expression of items in an artistic scheme is the focus of this paper. This focus is so the educate how the numbers that one may choose to guide the painting or song or sculpture or whatsoever else may guide more precisely the definition of the overall feeling and exaction of the thing being expressed. Numbers, logic, order and heuristic (all of which come about well by the time one incorporates numbers in simple grade school algebra) are the simplest and most general way to guide a painting or

instrumental piece of music without bringing up something in specific to do with the physical nature or definition of something in exponentially greater detail.

Numbers are everywhere and, the more recurrent or important they are to mathematics and science, the more likely it is that the number or geometry plays a role in the symbolism of what is being expressed.

A few good examples:

-A painting of a modern soldier using a gun with bullets of lead, but the bullets flying in the perspective front are in the mathematical structure of the electron valence of lead, the atomic element that comprises the bullets. This may impart more of a feeling of the material of the bullets in the painting.

-A painting of a classical instrument, which uses many spirals and curvatures expressible by a mathematical function, and the wrinkles on the face of the aged player playing the instrument in the frame being in proportion to the orientation and proportions of the spirals in the instrument.

-A sad instrumental musical piece, whereat the strings of an instrument are tuned relatively to the relative angular tilt or positioning of strained muscles in the face of someone making the intended emotional expression.

These examples are highly limited to the ultimate generous optioning of the mathematical approach to art and music, and these particular examples are impressionistic. Some expressionist examples:

-Abstracting the mathematical proportion of the joints and bones in a squirrel's skeleton and their positions to the start, stop, and amplitude peaks of notes in a musical composition 'about a squirrel.'

-Abstracting the mathematics of a squirrel's skeleton to the skeleton of a similar creature, and swapping their skeletal structures in a painting in order to impact a bizarre and abstract geometrical hint that the two are associated or spiritually connected. This symbolic implantation is exceptional in symbolically driven allegories and underlying messages.

-Abstracting a series of numbers to colors, space, tone etc. in a painting or song in so that one may express logical boundaries and a feel for the map where one's mind should access and explore their perceptions throughout the piece.

-In music or painting; using proportionate tones, loudness, brightness of color and darkness on different slope curves in gradient or in sequences of space to progress a feeling for points in a series that show how one would want to relate to such parts in series with other parts of the artistic feature. It can be used to make logical boundaries that go deeper

than just that, for the reference by a painting with three monks with one with a shroud on, it would be painted darker. 'The shrouded monk in the painting is darker in color than the ones with their hoods down,' so it can be made to be proportion darker that it can have a logical effect on the viewer that you may relate transformations of the other monks' color as relevant to the shrouded monk and so that the monk feels more important, or it can be more factorable to a simple subtraction of tone and so it feels as though the monk is just a simple downcast on the scene.

-In literature, which is highly audiovisual and sequential, you can format text and use typefaces that mathematically reflect the feeling of the text. You might want to look into, how vocal harmonics of the words being said play in mathematically, the complexity of the logical possibilities for impact from any possible section of text to be quoted from your text, as well as the effective length of sentences and etc. One might vastly benefit from fields of mathematics such as grammar theory, or taking measure of your own amount of time to read different words and making plots of associations between words in order to weave intricate sequences and harmonious resolutions between concepts created through the contiguous connected wordclouds.

Numbers are a powerful artistic tool, and careful attention to detail in art and music can be shown to pay off. Mathematics is a simple way to derive and complexify relationships between focus points in any expressive scenario. Simply making measurements and plotting mathematical points to follow when constructing a piece can provide for highly interesting results when considering for the potential to interpret and reinterpret the relationship between items in a composition.

The Golden Ratio, and Fibonacci Sequence were commonly used by famous artists such as Leonardo DaVinci, the Greek architects, Michelangelo, Salvador Dali, and countless other artists in the process of making art and music and invention. These two mathematical concepts are important for one's arsenal of mathematical technique, according to such reputable sources as DaVinci and Michelangelo for instance. The paper continues with the topic of the point that the author has continued the work in the field of mathematics that are readily mixed with art forms and music.

And so then, the paper will now end in a mention of your author's recommended reading of the rest of his papers: Study on Novel Geometric and Numeric Methods, New Formulas for the Trigonometry of Isosceles Triangles, Postulate of Time and Space and The Behavior of Negative versus Positive Numbers, Scientific and Mathematical Theories and Inventions, and etc.